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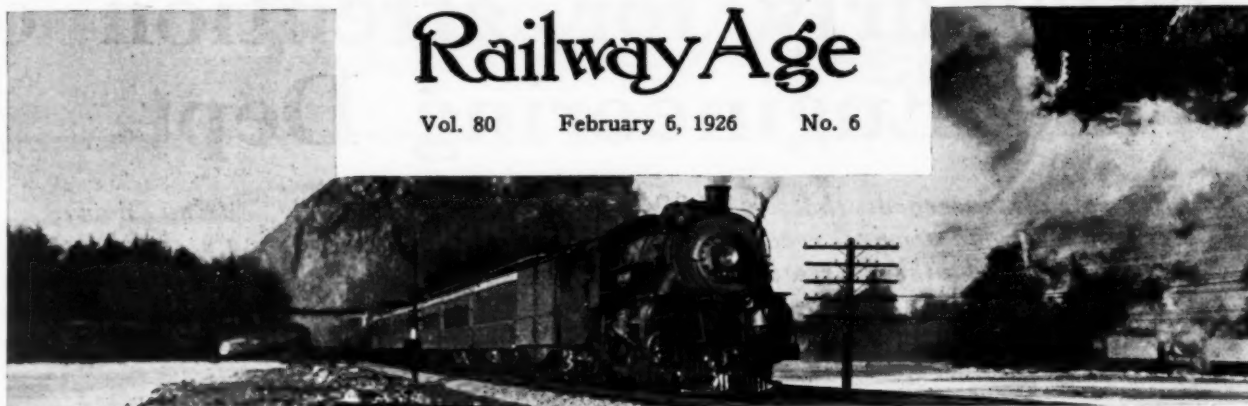
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Railway Age

Vol. 80 February 6, 1926 No. 6



On the New York Central in the Hudson Valley—Photo, Ewing Galloway

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Railway Age

Vol. 80, No. 6

February 6, 1926

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Page 5 of Advertising Section

Taxes Increase 500 Per Cent in Twenty Years

DURING the last twenty years, and also during the last ten years, the taxes of the railways have increased more in proportion than any other form of their income or outgo. This is shown strikingly by the following statistics: In 1905 taxes consumed \$1 out of each \$35.47 of total earnings; in 1915, \$1 out of each \$21.55; and in 1925, \$1 out of each \$17.14. In 1905 the carriers paid \$1 in taxes for each \$23.69 of operating expenses; in 1915, for each \$15.17; in 1925, for each \$12.71. In 1905 they paid \$1 in taxes for each \$14.31 they paid in wages; in 1915, for each \$9.28; in 1925, for each \$8.06. In 1905 they paid \$1 in taxes for each \$14.31 net operating income they had available for interest and dividends; in 1915, for each \$5.13; and in 1925, for each \$3.14. Between 1905 and 1915 taxes increased from \$58,712,179 to \$133,276,330, or 127 per cent, and in 1925 they were about \$360,000,000, or about 500 per cent greater than twenty years before, and 170 greater than ten years before.

Geographical Appointments to I. C. C.

NO revolutionary change in the make-up of the Interstate Commerce Commission would result in the near future from the passage of Senator Smith's bill to provide for regional appointments, but the idea of trying to set up a regulatory body with quasi-judicial power but composed of advocates for particular sections of the country represents a wrong principle. Doubtless the policy which has been followed to some extent for several years of appointing as members of the commission representatives of particular group interests has also been unfortunate, and the fact that it has left a very large section of the country without a member on the commission has brought about the present demand from many sections for a law requiring appointments to be made geographically. However, an unofficial statement by the President that he has appointed a man because of his former connection, experience or sympathy with a certain group interest that has recommended the appointment is vastly different from a legal designation of a man as a representative of a section. In the former case a man is not bound by his former connection and in seven years, or after reappointment for another seven years, may very easily develop a broader outlook from his experience on the commission, while under the original plan he could be criticized without great injustice if he allowed his local viewpoint to be obscured by larger considerations. Moreover, it seems extremely doubtful whether the appointment of commissioners from groups containing eight states as an average will at all satisfy some of those who are clamoring most loudly in Congress now. If the bill were to be passed the South Atlantic group would at once get a commissioner and the New England and Gulf groups would each get an additional one as soon as vacancies occurred,

but Texas does not seem to have been appeased by the recent appointment of a man from Alabama any more than have the South Atlantic states from which Senator Smith comes. Senators from states in the proposed Lake group have complained in the senate because their states have no commissioners, yet there are three from that group as constituted by the bill and there are also three from the group which includes Pennsylvania, one of whose Senators has been particularly vociferous on the subject.

The Fireman's Exacting Responsibilities

THE letter from George W. Booth, printed in another column, describing in very terse language certain bad practices in connection with the handling of train orders on locomotives, deserves the careful attention of every operating officer who depends for the safety of his trains on the use of such orders. The only thorough remedy for the defect or fault to which Mr. Booth's letter refers is an efficient space-interval system, constantly maintained. Such letters as Mr. Booth's are printed for the benefit of those roads which will not adopt the block system, the number of which continues regrettably large. Mr. Booth's letter is one of a number, brought out by recent collisions, which must for the most part be left unpublished, for lack of space and for other reasons. These letters deal with certain phases of train operation which ought to be taken up by the proper committees of the American Railway Association. One of the letters chides the Editor for publishing a communication (December 5, signed "Wall Street") which, at least by implication, demands that a hard-worked fireman on a fast train shall unerringly see a wayside signal every 50 or 60 seconds; and this in a fog so dense that he can have only two or three seconds in which to find each signal. While editors do not hold themselves responsible for the opinions of contributors, it seems proper, in this case, to call attention to the fact, which was referred to in the letter, that it is the rule-book—that is, the railroad company—which imposes this severe requirement upon the fireman. "Wall Street," in making his impossible demand, is in respectable company. Readers of the *Railway Age* need not to be reminded that the futility of this rule, illustrated in scores of collisions, has been shown times without number.

When All Hands Forget

THE block system is superior to the time interval system of operating trains because, for one thing, of the very much smaller chance of error or neglect; but just how much smaller? More pains should be taken to find out and define the difference between the two systems, with the clearness necessary to fix the essential facts in mind. For instance, collisions have occurred (no block system being in use) because six men all at one time forgot the existence of an opposing train. The lessons of

cases like that ought to be magnified, with a view of making listless or forgetful trainmen learn, in spite of themselves. The Interstate Commerce Commission has reported on a collision at Bryan, Texas (noticed in another column), where five men neglected plain duties (not to mention the two firemen, who could have taken action) and where any one of the five, doing his duty, could have thwarted the wrong action of the other four. The government report contains the usual paragraph to the effect that an adequate block signal system would have prevented the collision; but in view of the fact that the completion of an adequate block signal system takes much time as well as much money, would it not be wise to prescribe some additional remedy which could more readily be put in effect? A wide-awake superintendent, finding conductors and enginemen who lack the alert mind needed to grasp the complications incident to the adjustment of meeting points, would probably take measures to stiffen up Rule 93 (requiring low speed by all trains at all times within yard limits). Indeed, if one were to set out to improve without delay the conditions at the hundreds of places like Bryan which need such improvement, he would practically be forced to make use of that rule, more or less generally, and to get it obeyed. For, whether he continues without the space interval, or introduces the simple manual block system, he needs a low-speed rule at the block stations to cover the months or years which must elapse before he can provide complete interlocking, with distant signals.

Power Brake Tests at Purdue

WHEN the American Railway Association appointed a director of research in December, 1924, and authorized expenditures for a new test rack and power brake equipment at Purdue University, Lafayette, Ind., it was with the object of conducting a thorough and unbiased investigation which would indicate beyond a doubt what type of equipment (either now in use or subsequently developed) is best adapted to meet the demand of the Interstate Commerce Commission for improved power train brakes. This hope of the American Railway Association at the present moment seems almost certain of realization. What is apparently the most comprehensive, critically accurate and unprejudiced study of brake action ever made in this country is now in progress at Purdue University under the supervision of H. A. Johnson, director of research of the American Railway Association, as described on another page of this issue. One has but to visit the test plant at Purdue to be impressed with the magnitude of the work, its importance and the signal success which has so far attended efforts to make the investigation accurate and unprejudiced. A staff of 30 specially-trained men, not picked from college undergraduates, is working 44 hours a week on 565 separate tests which will not be completed until the end of the present year. An idea of the scope of the work and incidentally its cost may be obtained from the fact that 20,000 rolls of paper for use in the recording instruments were purchased at a cost of one dollar a roll. The entire expense however, will be but a small fraction of what it would cost the railroads to make independent investigations in an attempt to meet the commission's order. The steps taken to make the tests unbiased are noteworthy. None of the test observers were recently in railroad service and all signed a written agreement not to enter the employ of any air brake company for a period of five years following the termination of the tests. Moreover, the trainograph, built after almost a year's continuous effort to develop an instrument which would meet the needs of this work, practically eliminates the human element in recording original data on the

charts. The accuracy of the instruments and the way in which they are synchronized so that charts can be compared and checked, one with another, is little less than phenomenal. Representatives of the air brake companies and the Interstate Commerce Commission, Bureau of Safety, are in constant attendance at the tests and the enthusiasm of all concerned promises well for the success of this important step of American railroads in joint research work.

Studying Motor Transportation Possibilities

A MOST interesting and significant development of the last six months has been the extended and comprehensive studies made by a number of railways of the motor vehicle, both rail and highway, and its adaptability to railway service. On a few roads, an officer of higher rank has been assigned to the task of determining the advantages and weaknesses of motor vehicles as compared with steam trains and their adaptability to the local problems of his line. On other roads, committees composed of officers from the mechanical, the engineering and the operating departments have made similar studies, each considering the situation particularly from the viewpoint of his own department. These committees have inspected the installations of motor equipment on roads which have been pioneers in this direction and have then gone thoroughly over their own lines, giving minute attention to local problems of physical characteristics and existing competition. Upon this sound basis, conclusions as to future procedure have been reached. These studies have given a generally true picture of the comparative advantages and shortcomings of steam trains and rail and highway motor vehicles and have made possible authoritative decisions on the question of how the public can be rendered the best possible service at the least cost. Incidentally the studies have resulted in some surprising conclusions on questions such as the extent of the "competition" between railway transportation and highway transportation. Through such comprehensive, open-minded studies, and only through them, can the problem of whether motor transportation should be adopted by the railways be rightly answered. Such studies should be made by every road.

Making Day Coach Travel More Pleasant

ON another page we publish a letter to the editor in criticism of railroad day coach facilities. "Coach passengers are," the writer says, "invariably herded around like sheep, put on slow and inconvenient trains, in dirty and overcrowded cars, denied every convenience, and treated with a uniform lack of consideration." The writer has probably been unusually unfortunate in his experience; conditions as bad as he portrays certainly are not universal. At the same time, railroad men will recognize that complaints of this character are serious enough to merit some attention. Where conditions approach the picture of disorder and even filth which this letter portrays, who is primarily to blame? There are always some individuals who do not object to such conditions and who will do their share toward creating them, and such persons are more likely to be found in coaches than in Pullman cars. The railroad is not a schoolmaster; it cannot punish those whose actions make its coaches disagreeable places for more refined persons. Possibly,

however, in many cases attention could well be devoted toward cleaning the cars more carefully, and perhaps the lavatory accommodations would bear improvement. There would remain, however, those people who, wherever they ride will create unpleasant conditions for their fellow-passengers. The writer complains that the only provision for refreshment in coaches is the sandwich sellers. As a matter of fact coach passengers can avail themselves of the dining car just as the Pullman passengers do. The fact that often they do not, and turn the coach into a picnic ground instead, is beyond the control of the railroad. However, the complaint made by the writer still stands—day coaches are at times extremely unpleasant places to ride. What can the railroads do about it? Criticisms of the kind published in this letter are a challenge, whether the railroad is responsible for the conditions or not.

Railway Purchases and Traffic

THERE have been circulated recently an unusually large number of reports regarding the use by large concerns of the traffic they can give or withhold as a means of getting railways to make purchases from them. This is a means of influencing orders placed by the railways that, for obvious reasons, can be employed with much more force by large companies that sell only part of their products to the railways than by competing smaller companies that sell most or all of their products to the carriers; but the latter should not be placed at an unfair disadvantage merely by traffic considerations.

The shifting of traffic from one road to another through the influence of purchases will not increase the total volume of traffic. Therefore, it is of no advantage to the railways as a whole, and is likely to be of only temporary advantage to the road that gains by it. On the other hand, a uniform policy on the part of the railways of making purchases solely on the basis of quality and cost, whether from large or small concerns, will tend constantly to reduce their expenses because it will tend to stimulate all equipment and supply companies to strive constantly to improve the things they sell and reduce the costs of producing them.

It is natural that a railway that makes purchases from a concern should use this as an argument for getting traffic from it, and that it should from considerations of both traffic and costs make all the purchases it reasonably can in its own territory. It is equally natural that a concern that gives a railway a large amount of traffic should use this as an argument for the railway to make purchases from it; but it is plainly an argument that can be used and acted on in ways that would be dangerous. It should always be generously qualified by the words, "other things being equal." When a concern asks a railway to buy from it something the quality of which is as good and the cost as low as those of something similar that a competing concern offers for sale, it is doubtless legitimate to throw the traffic argument into the scale. But the law under which the railways are regulated requires them to be efficiently, economically and honestly operated. Therefore, if a concern uses the traffic argument in an effort to get a railway to buy an inferior article at the same cost, or an equally good article at a higher cost, than that for which it can be bought from some competing concern with less traffic to offer, it is asking those who make purchases for the railways to disregard the provision of law requiring efficient and economical operation.

There are other features of the matter which should be considered. It is frequently charged by radical politicians and labor leaders that railways make purchases at un-

necessarily high prices because of undue influence directly or indirectly exerted upon them by large industrial concerns. Disclosure of the fact that a railway, in order to get or keep traffic, had made purchases at higher prices than otherwise would have been paid would be very damaging to the railways. It has often been proposed that the Interstate Commerce Commission should regulate the prices at which railways make purchases. No man in his right mind wants to create public sentiment in favor of that. Then, the laws that make a criminal offence of rebating should not be overlooked. It seems not impossible that, if it should be disclosed that, to get traffic, a railway had made purchases at unnecessarily high prices, the courts by a broad interpretation of the law might hold that this was a device for getting and giving rebates on the traffic thus obtained. The penalties of fines and imprisonment for rebating are heavy and equally applicable to those who give and receive them.

"Other things being equal," there can be no just criticism of a concern that uses the traffic it gives a railway to get business from it. But the railway is required by law to give the same quality of service at the same rates to all its customers; and it cannot legitimately, because one concern has a larger traffic to give than another, pay it a higher price for a thing of a given quality or value, than it would pay the other concern or the same price for a thing of lower quality and value. The facts about the business transactions of railways are so readily accessible to government authorities, and their position is always so vulnerable, that it can never be safe for them to do anything that cannot be publicly defended as consistent with the most efficient and economical operation.

The Unanimous Consent Proviso

THE article "The Potter Plan as a Pool" by J. Shirley Eaton, which appears on another page of this issue, is published not because the *Railway Age* agrees with the views and conclusions contained therein but rather because it believes that the arguments presented are entitled to a hearing. Due cognizance is made in this connection to the several references from the Railroad Gazette. It would appear that Mr. Eaton has notably made two important errors of omission. First, he seems to present the view that in the days when pooling was common, the railways favored pooling. Second, is the omission of reference to the law as stated in section 5 of the Transportation Act, wherein pools are sanctioned with Interstate Commerce Commission approval, but with the proviso also that there must be unanimous consent of the carriers involved.

Is the view correct that in the days before pooling was declared unlawful the railways favored pooling? The record shows that the railways established pooling, not because they wanted to but because they had to do it in self-defense against each other. It is certainly true that the pooling arrangements were upset frequently by individual roads, and that the pooling commissioner had to display extreme skill to keep the several roads in line. It is significant that the weaker road was frequently the one that offered the most severe competition that the pool was organized to keep in hand. The weak road, sometimes in receivership and then temporarily relieved from paying fixed charges, cut the rates and made the organization of the pool desirable or necessary, but the impression cannot be given that the carriers went into the pool willingly. It is a peculiar coincidence that the road that is causing consideration to be given to the Potter plan of pooling is temporarily a weak road and in financial straits. The difference is that in the old days the St. Paul would

have cut rates, made a desperate attempt to get business and thereby have upset established relationships, whereupon the competitor carriers would have organized a pool for the purpose of keeping the situation in hand. Today, on the other hand, it is the weak road that is proposing the pooling arrangement, and with the further difference that it is going to the government regulatory authorities for help in putting the pool into effect.

The law relative to pooling is contained in paragraph 1 of section 5 of the Transportation Act:

That, except upon specific approval by order of the Commission as in this section provided, and except as provided in paragraph (16) of section 1 of this Act, it shall be unlawful for any common carrier subject to this Act to enter into any contract, agreement, or combination with any other common carrier or carriers for the pooling of freights of different and competing railroads, or to divide between them the aggregate or net proceeds of the earnings of such railroads, or any portion thereof; and in any case of an agreement for the pooling of freights as aforesaid each day of its continuance shall be deemed a separate offense: *Provided*, that whenever the Commission is of opinion, after hearing upon application of any carrier or carriers engaged in the transportation of passengers or property subject to this Act, or upon its own initiative, that the division of their traffic or earnings, to the extent indicated by the Commission, will be in the interest of better service to the public, or economy in operation, and will not unduly restrain competition, the Commission shall have authority by order to approve and authorize, if assented to by all the carriers involved, such division of traffic or earnings, under such rules and regulations, and for such consideration as between such carriers and upon such terms and conditions as shall be found by the Commission to be just and reasonable in the premises.

This clause changed the law by permitting pooling with certain safeguards, whereas pooling prior to the passage of the Transportation Act had been forbidden. It will be noted that the types of pooling named include traffic, gross revenue or net earnings pools. It is not necessary to determine, therefore, in which category the Potter plan belongs. It calls for the pooling of a 5 per cent increase in rates, and may on that score be a gross earnings pool, but it proposes the distribution of the proceeds of the rate increase in the proportion of the deficiency of each carrier under its fair return, and in that respect is a net money pool. However, there are two important provisos: (1) Approval by the Interstate Commerce Commission, which, it will be noted, may act to establish a pooling arrangement upon its own initiative, and (2) commission approval "if assented to by all the carriers involved." It is difficult to believe that unanimous consent will ever be given to the far-reaching proposals of the Potter plan by all of the 60 or 70 carriers in the western district.

For Whose Protection Are Tie Specifications Prepared?

"WE all know that in the last few years the railways have been raising the acceptance standards for cross ties. We also know that higher acceptance standards mean greater wood waste and decreased stands of timber suitable for ties." With these statements Aldo Leopold, a representative of the Forest Products Laboratory, Madison, Wis., criticized the railways, in a paper presented before the convention of the American Wood Preservers' Association in Cleveland last week, for the specifications which they have prepared to insure their receipt of ties of the kinds and sizes that their experience has indicated are required for their needs. To support his criticism he cited the case of a western railroad that is considering a specification which will involve the rejection of ties made from dead lodge pole pine, although he offered no proof in support of his implication that this timber would give as satisfactory service for ties as those cut from live trees. On the other hand, it is reasonable to assume that the railroad has decided to reject this timber only after a careful investigation had given it sufficient grounds for this step.

As the buyer of materials, every railway is charged with

responsibility for purchasing those materials that will yield them the best service for the money and the consideration of the problems of the producer are of necessity secondary. With the increasing number of ties that are treated and the greater investment made in them through treatment, the railways have been forced to adopt higher standards for their ties for it is obvious that they cannot afford to treat under-sized ties that will fail from mechanical causes before the value of the treatment is realized.

As far as waste is concerned, this is a problem of the producer rather than the consumer for the disposition of the so-called waste is primarily a problem of merchandising. In foreign countries every portion of a tree is cut into some usable product. Because of the vast timber resources of this country, we have been wasteful in our utilization of forest products but the time is rapidly approaching when the producer of timber products like the meat packer, must develop ways to utilize his by-products in order that he may adapt his production to the needs of his major customers, rather than expecting them to reduce their requirements to meet his convenience. In considering this subject, the dual position of the United States Forestry Department should also not be overlooked for while interested in the technical development of wood utilization, this department is also a large producer and seller of timber and in the latter capacity faces the same problems and is confronted by the same desires as other timber producers.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian,
Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Apple Survey of the United States and Canada, by R. W. Rees. Considers production, transportation and marketing. Illustrated. 63 p. Pub. by Dept. of Agricultural Relations, New York Central Lines, New York City.

Legends of the St. Lawrence, compiled by Katherine Hale. Pictures by Charles W. Simpson. 47 p. map. Pub. by Canadian Pacific Railway, Montreal, Canada.

Report on Visit to the United States of America, by Col. the Hon. F. Vernon Willey and Mr. Guy Locock. "State of efficiency in the U. S." p. 7-10. "Railways" p. 8, 10. 12 p. Pub. by Federation of British Industries, London, England.

South African Railways and Harbors. Report of the General Manager for the Year Ended March 31, 1925. Includes 44 statistical statements, 16 pages of illustrations, 6 harbor plans, and various diagrams. 156 p. Pub. by Govt. Printing and Stationery Office, Pretoria, South Africa. 7 shillings 6 pence.

Periodical Articles

Consolidation or Government Ownership, by Senator Simeon D. Fess. Discussion of solutions of present railroad problem. Country Gentleman, February, 1926, p. 11, 92, 95.

An Estimate of the Present-Day Merger Movement, by Avar L. Bishop. Influences of financial problems, operating economies, personal ambition and other factors on the tendency towards consolidation of industrial concerns, railroads, etc. Annalist, January 22, 1926, p. 151. January 29, 1926, p. 181-182.

Stevens Has Blasted and Bridged His Way Across America, by Marion T. Colley. The career of John F. Stevens. American Magazine, February 1926, p. 16-17, 74-92.

Letters to the Editor

Handicapping the Fireman

MILWAUKIE, Oregon.

TO THE EDITOR:

In looking over the accident reports of the Interstate Commerce Commission published in the *Railway Age* during the last twelve months, can anyone help but ask; Where was the fireman?

Numerous engineers drove by meeting or waiting points to their death and the fireman rode with them, making no attempt to remind the engineer of orders. Why do they do it? It can be answered I believe in three words: lack of system.

On a single-track line leaving a busy terminal, particularly on an extra train, the engineer is handed perhaps five or more orders. He reads them while the air-pump is pumping up the train line. By the time he hands them to the fireman it is time to leave. The fireman glances at the orders hastily, as the fire will need all of his attention in starting, especially if it happens to be an oil burner. The orders are then handed back to the engineer, who quite often sticks them in his pocket, and the fireman doesn't see them again.

I believe the practice of engineers in placing train orders in their pockets is a direct cause of many collisions. Every engine should be equipped with an order clip board. The orders will then be in view of the enginemen at all times. I believe engineers should be forbidden absolutely to place train orders in their pockets. It is impossible for the average fireman to remember the contents of all orders reading them through only once, particularly if there is a number of "waits" or "run lates." A train order attached to a clip-board and fluttering in the wind, is worth more than a dozen in the engineer's pocket.

The best way to handle train orders after they are read is to place them on a clip-board, in the sequence to be executed, with the clearance card uppermost. As each order is executed it should be removed and put out of sight. To leave them on the board only adds to confusion. The next order should be read again; and when executed it also is removed, following that system to the last order.

The above method should also apply to time-card reading. The time-table is a finely perfected invention, though one thing is against it—bulkiness. That seems to be a necessary evil. This makes it clumsy to handle on a rapidly moving engine, with the result that enginemen try to crowd too many train movements into their heads at one time, so as to avoid repeated references to the time-table. That is a poor excuse for taking a chance, but such conduct seems to be one of the characteristics of human nature. No matter how careful an engineman may be, if he believes that his memory is infallible, he will crowd it with too many train movements; and this results eventually in overlooking a train.

The less an engineman depends on his memory, the safer single track operation will be. Operating officers should forbid putting train orders in the pocket, of that I am sure; and if the orders are placed where the fireman can refer to them at any time without asking the engineer, he will be in a better position to check the movements of his own or other trains.

When a trainman or an engineman takes the train-rule examination it should be impressed on him not to crowd his mind with the time of a number of opposing trains;

but to observe them one at a time. The rule applies when reading time-tables or train orders.

It is the practice of some roads now to omit the engine numbers in train orders. That is a long step towards reducing the confusion in reading the orders. I believe there is yet room for reducing the number of words in the standard order forms. Reducing the number of words would also help to lighten the responsibility of seeing that the order was correctly filled in. Addressing, dating and completing the orders should be up to the operators and dispatchers.

GEORGE W. BOOTH,
Southern Pacific Fireman.

A Criticism of Day Coach Service

BERWYN, Illinois.

TO THE EDITOR:

I was very much interested to read in a recent issue a letter regarding the discomforts of the "day coach," for I have been compelled to make several long trips through the East in coaches, and therefore feel very strongly, not to say bitterly, on the subject.

The difference in service rendered to coach and Pullman passengers, aside from the comfort of the cars themselves, is a cause for complaint. Pullman passengers are invariably given the best of courtesy, service and speed by the railroad while coach passengers are invariably herded around like sheep, put on slow and inconvenient trains, in dirty and overcrowded cars, denied every convenience, and treated with a uniform lack of consideration that borders on contempt. In fact, the holder of a coach ticket may well feel that the railroad regards him as a nuisance.

As to the cars themselves, nearly everything is wrong with them. With no adequate ventilation system they are unspeakably hot and dirty in the summer and in winter are always over or under heated. The toilets are invariably filthy and many of even the modern steel coaches have no washstands at all while those which have washstands have them stuck in one corner of the trainman's seat—an arrangement which is a travesty on American standards of hygiene and convenience. With no janitor or porter service there is no one except a usually insolent conductor to attend to any of the needs of the many passengers crowded into these cars. With no provision for refreshment except the sandwich sellers, the car quickly takes on the aspect and odor of a garbage wagon—and, of course, there is no one to clean up.

Can you imagine any other manufacturing or selling business treating its customers like that? The trouble probably is that the railroads realize that coach passengers travel that way only from necessity and that therefore it is not necessary to give them any consideration. Of course, they are right; no one travels in a coach from choice.

Nevertheless, the coach passenger pays full price for his railroad ticket which reads "one first-class passage," and it would seem only fair that he should receive reasonably fast, comfortable and convenient transportation. Why is it necessary to always pay tribute to the Pullman Company in order to secure anything like adequate railroad service?

Aside from the possible revenue from increased passenger traffic, it would seem that as a matter of expediency the railroads should improve their coach service. For after a long trip in a coach under present conditions a person with any instincts of decency is usually so thoroughly outraged that he is willing and anxious to vote for any law, plan or person hostile to the railroads in the hope that the present management may be thrown out and a more considerate one installed.

R. H. RUSSELL.



The First Stripping, the Black Area Is the Surface of the Coal Vein

Railroad Opens Large Strip Mine in Rosebud Coal Field

Northern Pacific develops semi-bituminous supply in central Montana for company use

By H. E. Stevens

Chief Engineer, Northern Pacific, St. Paul, Minn.

DURING the past year the Northern Pacific has been using coal taken from a strip mine which the railroad has developed in what is known as the Rosebud coal field in south central Montana. The available supply is a large one, comprising a thick vein covering a wide area with an overburden of such character that open pit mining is particularly advantageous. The studies made in determining the possibility of this field, the manner of development and method of operation are described below.

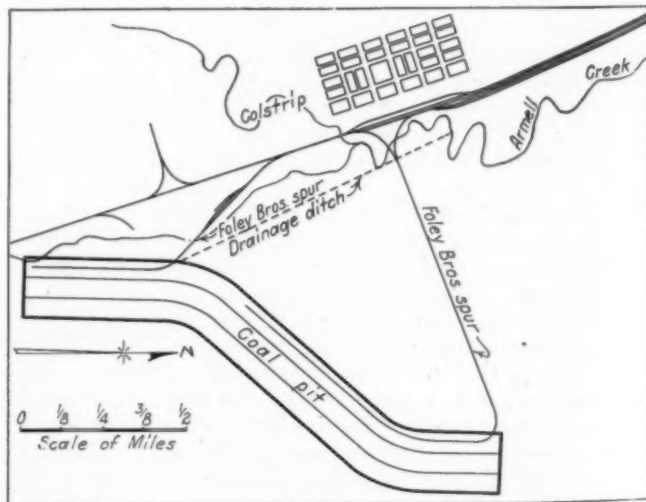
From a general geological examination made for the

where eroded or burned out. No reliable estimates are available of the total volume of coal in the vein, but from this outcrop survey it was estimated that there were at



The Large Drag Line and Shovel Machine Used for Stripping

Northern Pacific in 1913 it was determined that this vein underlay an area of approximately 700 square miles in Montana and an unknown larger area in northern Wyoming, and that the full depth of the vein was 28 ft., this thickness being maintained over the entire area, except



The Arrangement of the Pit for Operation

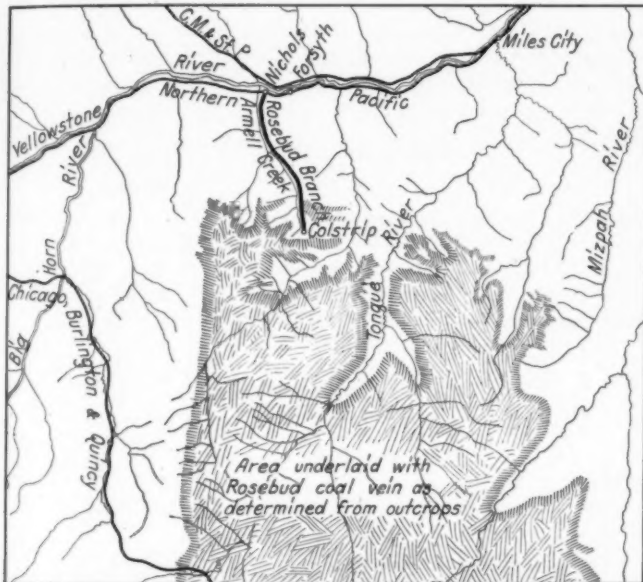
least 6,000,000,000 tons in the Rosebud vein within the state of Montana alone.

Although the Northern Pacific, through its subsidiary, the Northwestern Improvement Company, owned and operated some good mines at Red Lodge, Mont., the possibility of developing a more economical locomotive fuel supply from the Rosebud field was such that the chief engineers of the railway was directed in 1917 to make a thorough exploration and report, covering methods and

the cost of reaching and opening the Rosebud field, and the comparative value of that coal as a locomotive fuel.

The Survey Covered 15 Square Miles

The exploration covered 15 square miles in the north-erly edge of the field near the headwaters of Armell creek. A complete topographic survey was made of this area and sufficient borings put down to establish the top and bottom of the coal seam over the entire area, giving in effect a topographic map of the top and bottom of the coal, as well as of the ground surface. All coal



The Relation of the Rosebud Coal Field to the Main Line of the Northern Pacific

having 100 ft. or less of overburden was classed as stripping tonnage, while coal lying at a greater depth was classed as mining tonnage, the totals for the 15 square miles being as follows:

	Tons
Stripping volume	150,000,000
Mining volume, 50 per cent recovery	90,000,000
Total	240,000,000

The chief engineer's report recommended the construction of a railroad up Armell creek, and the opening of a strip field about 30 miles directly south of Forsyth, Mont.

Under its land grant the railway retained ownership of the mineral rights over a great many odd numbered sections lying within the limits of the Rosebud field. It had, however, relinquished surface rights on some of these sections and the statutes as they then existed provided no way for the railway to obtain mineral rights in the even numbered sections necessary for continuity of operation as a strip field.

Five shafts were sunk to and through the coal seam at various locations within the area explored, and from one of these shafts about 400 tons of coal was mined and hauled across the country to the railway tracks for actual test in locomotive firing. These tests demonstrated that this coal could be used successfully as locomotive fuel, although it would require some changes in the existing methods of drafting and firing.

Test samples were taken from shafts and drill holes, the average analysis of 48 samples being as follows:

Loss from air drying	12.30
Retained moisture	11.06
Volatile combustible	51.20
Fixed carbon	29.94
Ash	7.77
Sulphur	0.67
B. t. u.	10,825

In the locomotive test runs a comparison was made with Red Lodge coal with the following results:

	Red Lodge	Rosebud
Pounds of water evaporated per pound of coal	5.81	4.33
Pounds of coal per 1,000 ton miles	104	146
Pounds of coal per drawbar-horsepower-hour	4.72	6.77
Tonnage hauled	1,794	1,283

The above figures were the average of six round trips over an undulating one per cent grade with the heaviest class of freight power. From these figures it was determined to make the economic comparison on the basis of 1 ton of Red Lodge coal being equal to 1.4 tons of Rosebud coal.

Investigation Demonstrated

Economy of Development

On this basis, and on the further assumption that a railroad to the coal field would develop no additional business of consequence, it was estimated the railway would make an annual saving of at least \$700,000 by substituting Rosebud for Red Lodge coal as locomotive fuel over the territory between Mandan, N. D., and Missoula, Mont. No action was taken on the report until the fall of 1922, when the board of directors authorized the construction of the branch line and the opening of the field.

The construction of the line was awarded to Winston Brothers of Minneapolis. Work was started in the spring of 1923 and the track completed to the coal field in De-



The Coal Loader and Train Showing the Cable Reel Car in Front of the Electric Locomotive

cember, 1923. Ballasting was deferred until the season of 1924, and the line was turned over to operation on September 1, 1924. Meanwhile a small test pit lying under a comparatively shallow overburden was stripped with grading machines and about 45,000 tons of coal were delivered to the mechanical department for further locomotive tests with the purpose of determining proper drafting, firing, etc.

As the Northwestern Improvement Company was not equipped or organized to handle a large excavation job it was decided to open the field by contract. It was thought, however, that it might later be desirable to operate the field by company forces and a five-year-limit was fixed for the first contract operation. In order to avoid interruption in the operation in the event that the field was taken over, it was necessary to make a provision in the contract under which the Improvement company would

come into possession of the equipment at the termination of the contract. At the same time it was desired to leave the contractor free to select and install equipment which, in his judgment, would handle the desired output of coal most economically. The contract, therefore, carries somewhat unusual provisions covering the division between unit costs and equipment costs. Briefly, it provides that the contractor shall furnish and install the complete plant necessary for the efficient and economical operation of the field, with the exception of standard-gage locomotives, and 56-lb. rail, which were to be furnished by the Improvement company and turned over to the contractor.

The contract was awarded on the basis of bids embracing unit prices for common excavation, hard pan, loose rock and solid rock and for loading coal into the railroad's open top cars. It provides also for adjustments of these prices with changes in the rates paid by the contractor for labor employed on the work. It covers in addition the acquisition of the contractor's equipment by the Improvement company at the expiration of the contract, which is to be paid for in 10 equal semi-annual payments. Foley Brothers, St. Paul, Minn., were the successful bidders.

The preliminary exploration of the field had developed the fact that the question of water supply would become an important one; in fact, no dependable surface water supply was available, and it was questioned whether any supply could be developed from the pit. Consideration was given to the fact that the test shafts had filled with water as soon as put down and it was thought that the drainage ditch from the shovel pit would provide an adequate volume of water, although it was known to be of extremely poor quality for boiler purposes.

The opening of the drainage ditch and of the preliminary test pits developed the fact that no real ground water supply was available, either above or below the coal seam, and after thorough consideration of the situation it was decided that electric operation presented the only reliable method of handling the field. No power line was available nearer than Billings, a distance of 100 miles. It was therefore necessary to make an adjustment in Foley Brothers' contract, providing for the construction of a power line from Billings, and a change from steam to electrically operate equipment. The contractor immediately placed orders for an electrically operated drag line and a shovel and studied the problem of power for switching and car spotting. Owing to the objections to either a trolley wire or a third rail on a shovel loading track it was decided that storage-battery locomotives presented the best solution, and orders were placed with the General Electric Company for two 60-ton locomotives which were placed in operation early in June, 1925. Their performance to date has been satisfactory and solved what had been a perplexing problem in the operation of this field.

The locomotives are equipped with an automatically operated cable reel car so arranged that locomotive batteries can be charged during the time the engine is in service spotting cars at the shovel. As it takes about 1½ hours to load a train, it is estimated that the amount of current which can be stored in the batteries during the spotting period will be more than sufficient to keep the batteries fully and continuously charged.

The equipment installed by Foley Brothers follows:

One 350-ton Marion revolving type combination drag line and shovel, equipped with 155-ft. drag line boom with a six-yard bucket and 90-ft. shovel boom with a six-yard dipper.

One 175-B Bucyrus revolving type shovel equipped with 75-ft. boom and a seven-yard dipper.

One Paige gasoline drag line with a 2½-yd. bucket and a 60-ft. boom.

One 20-ton American Hoist & Derrick locomotive crane.

Two 60-ton electric storage battery locomotives.

One Cyclone electric well drill.

Two Chicago Pneumatic Drill Company's portable type air compressors.

Each piece of equipment has been provided with a complete set of spare parts. A complete machine shop has been constructed and equipped with modern tools, all purchased new for this work. These include a Lodge & Shipley 20-in. lathe with 18-ft. bed; a Southwark 100-ton wheel press; a Gould and Eberhardt 24-in. draw cut shaper; a Nazel 450-lb. air hammer; a cut-off saw; a band saw; a bolt cutter and a wet and dry grinder. All tools are operated by direct connected motors and are well adapted for any machine work incidental to the coal field operation.

In addition a well appointed camp for the accommodation of the contractor's men as well as the Improvement company's staff has been provided, including a two-room schoolhouse for the children of the men in the organizations. The buildings are electric lighted and steam heated from a central boiler plant.

The Coal Pit Is Large

The pit is approximately 7,800 ft. in length; and will be cut to a width of approximately 900 ft. The estimated quantity of coal available in the pit is approximately 6,800,000 cu. yd. Foley Brothers contract will cover about 6,300,000 cu. yd. of stripping and 4,100,000 cu. yd. of coal loading. All but a small amount of the stripping lies below the 50-ft. contour.

The pit was opened by cutting in the Marion machine as a drag line, taking out a through cut about 125 ft. in width on the bottom the entire length of the pit. The Bucyrus machine is used as a coal loader and follows the stripping shovel on the level of the bottom of the coal seam. The loading track is laid on top of the coal seam. The sequence of operation is as follows:

The stripping shovel was cut in at the point where the track enters the pit and moved south to the south end of the pit. It then idled back over land to the point where first cut in, and moved north to the north end of the pit, followed, of course, by the coal loading machine. The stripping shovel reached the north end of the cut on July 1. It was then idled back, converted into a shovel and again moved north, taking a cut 88 ft. in width, casting the stripping over the loading track into the pit from which the coal has been removed. It is estimated the relative volume of coal and overburden is such that the progress of the two machines will bring them to the north end of the pit simultaneously, but if necessary the intermediate width of the stripping shovel cut will be varied sufficiently to bring about the relative rate of movement required to accomplish this result. The loading shovel will then turn south, loading the coal stripped by the stripping shovel on the northerly cut, the stripper idling back and renewing stripping in a southerly direction.

A meet will similarly be arranged between the two machines at the south end of the pit, which is estimated to be reached, at the present rate of coal consumption, about August, 1926. At this time a full cutting will be stripped ahead of the coal loader, this being the maximum spacing obtainable for single pit operation.

The output of the stripping shovel has been quite uniform for the different classes of material, so that with cross sections and borings available the estimated location of the stripper on any given date can be predicted with a fair degree of accuracy and meets arranged to suit the coal consumption required by the railway.

The engineering work for the opening and development of the field was done under the supervision of the writer. The operation of this field is under the general supervision of C. C. Anderson, general manager, Northwestern Improvement Company, Seattle, Wash., Lochren Donnelly, superintendent, is in direct charge of field operations, with headquarters at Colstrip, Mont.

Gross Ton-Miles Per Train Hour*

Use as an index of operating efficiency—How transportation is taught at Harvard

By W. J. Cunningham

Professor of Transportation, Graduate School of Business Administration, Harvard University

IN telling you about an interesting and successful experiment in enlisting employees' cooperation in freight train service efficiency by focussing attention upon a single and little used statistical index, I propose also to tell you something about one feature of the educational policy in the Harvard Graduate School of Business Administration.

The story of the experiment in enlisting the cooperation of transportation department employees is embodied in what we call a "case" under our system of instruction. We attempt to teach the principles of business by the study and discussion of actual cases or problems in which conflicting factors have play and in which business executives have made, or eventually must make decisions. A "case" is one in which a decision was reached or a definite policy adopted. The written statement contains a summary of all the important related facts with the decision and the reasons which influenced that decision. A "problem" contains a similar recital of all pertinent information, but it stops short of the decision. As a rule the problem had not been decided when the written statement was prepared.

In using a "case" we study the conditions, analyze the reasons which influenced the decision, debate the soundness of the decision, and consider possible alternatives. In using a "problem" we place the student in the chair of the business executive who ultimately must make the decision, require the student to analyze and weigh all pertinent factors, and to go through the motions of making the decision. His decision is criticized by the other students and in summing up the discussion the instructor gives his own views. We have found that this method, while it may take more time than a logical presentation of principles under the older lecture method makes a more lasting impression upon the student's mind, and the principles brought out in the discussion of an actual case are vitalized in such degree that they are easily seen and remembered. When a student is called upon to make a decision from a given body of real facts, with a real background, his mind is quickened, his analytical and imaginative powers are stimulated, and the school training enables him when he enters actual business after graduation to utilize more quickly and more effectively the value of the routine training in the minor positions he necessarily must occupy in attaining his practical experience.

The Case System of Instruction

Our cases and problems are collected, as a rule, by our Bureau of Business Research through its corps of field agents. These agents, with few exceptions, are graduates of the school, have studied under the case system and are specially trained for their work. The organization of the bureau, besides its director, assistant directors and supervisors, includes two research professors who have had business experience and who now give practically their entire time to the broader aspects of case collection and preparation. The work is financed, in the main, by the business houses and trade associations, in the interest of

business research. The identity and exact location of the company or firm are disguised in most of the written cases and these cases are made available to other universities and colleges of business administration. We have recently undertaken the publication of a selected number of cases in book form. The first volume was printed last fall and the second volume will soon appear.

In so far as it is practicable to do so without interfering with their classroom work the professors in the several departments of our school gather and write up cases and problems and they assist the field agents with leads and suggestions. Occasionally a professor is granted leave of absence to devote his entire time to enlarging his store of teaching material. Under that plan the University gave me leave of absence during the first half of the school year 1924-1925 and I spent the time in visiting the offices of most of the railroads in eastern territory. Through the cooperation of railroad officers I gathered a considerable number of cases and problems which are now being utilized in my courses in transportation.

A Transportation Case

The material for the story which I shall tell you this evening, and which I hope will be critically discussed from the floor, was gathered among the green hills of Vermont while I enjoyed the charming hospitality of the official family of the Central Vermont Railway. I shall read the case to you just as it was written for classroom purposes with the name and location disguised. When I have concluded the reading I shall attempt to point out and emphasize those features which I believe are of more than ordinary significance. Here is the story:

WALWORTH RAILROAD—METHOD OF AROUSING INTEREST OF EMPLOYEES IN TRAIN SERVICE EFFICIENCY

(Summary) In an effort to increase its operating efficiency and to justify certain capital expenditures for additional facilities, the management of the Walworth Railroad decided to concentrate its attention upon "gross ton-miles per freight train-hour." A campaign of education of minor officials and employees had the effect of increasing that unit from about 9,000 to about 13,000, and thereby of decreasing unit costs as well as increasing traffic carrying capacity. A part of the improvement was attributable to better facilities and new locomotives, but at least one-half of the gain was believed to be the result of successfully enlisting the interest of the men in the statistics of train operation.

The Walworth Railroad, an eastern carrier approximately 500 miles in length, served a somewhat sparsely settled agricultural community, and its freight traffic consisted principally of commodities which moved from midwestern points to the Atlantic seaboard. Its passenger service was relatively unimportant. The greater part of the freight traffic was overhead, for which the Walworth acted as a bridge carrier.

For a long series of years the Walworth Railroad had financial difficulties. Several years previous to 1924 it had passed through a receivership and reorganization. The reorganization was not entirely successful from the viewpoint of adjusting securities to correspond with net earning power, and the company since then had failed to earn dividends.

Prior to 1922 the greater part of the capital stock and a substantial part of the bonds had been held by the Granada Railroad. Although operated independently the Walworth was generally regarded as an affiliated part of the Granada System. The Granada, through over-expansion, had injured its credit, and it had so much difficulty in maintaining its own solvency that it was unable to give much attention to the needs of the Walworth. As a consequence, the Walworth was unable to

*Address before the New England Railroad Club on January 12, 1926.

finance needed improvements. Its trackage in terminals and sidings, its engine-house facilities, and its rolling stock were inadequate both quantitatively and qualitatively.

The Granada Company's financial troubles came to a head about 1922 and the control of the company passed to the Caledonia Railroad System, a company with larger financial resources. Following the change, the policy of the consolidated company toward the Walworth was one of helpfulness. The officials of the Caledonia recognized certain possibilities in the development and greater use of the Walworth and, after a careful investigation had been made, offered to advance the necessary funds for deferred improvements. A five-year program, in which approximately \$12,000,000 would be expended for additional sidings, additional tracks in yards and interchange points, strengthening of bridges, enlargement and rebuilding of engine-houses, new and more powerful locomotives, and new cars, was undertaken, and the necessary funds were made available to the Walworth.

The first part of the appropriation was spent in 1923, and a few of the urgently needed items in the program of betterments were completed. The five-year program was supported by a study and forecast in which a definite promise of substantial operating economies was given by the Walworth management. These economies could not be realized in their entirety until the full program of improvements had been completed, but the management of the Walworth was anxious to show favorable results from the initial expenditure of 1923. Since these expenditures had been mainly for additional sidings, rearrangement of yard tracks, new locomotives, and engine-house improvements, an effort was made to bring about substantial economies in train service costs.

Description of the Statistical Unit

The management took pains to acquaint the employees as a whole, and particularly those in train, yard, station, and engine-house services, with the object of the program, and set out to enlist their interest and co-operation. In order to focus attention upon one specific item, the management decided to stress the statistical unit "gross ton-miles per train-hour," to educate the employees to its significance, and, by increasing that unit, reduce operating costs, increase traffic carrying capacity, and give better transportation service.

The unit "gross ton-miles per train-hour" is the resultant of the train load and the train speed. Ordinarily, the major emphasis is placed upon the train load and relatively little attention is given to the train speed. Train costs correspond more closely with train-hours than with train-miles. Fuel consumption is more a function of time than a function of distance. Train wages in freight service, although stated in rates per mile, are in nearly every case virtually on an hourly basis, as the guaranteed minima in miles per hour are usually greater than the actual miles. The further factor of punitive rates for overtime hours has an important bearing.

It is obvious that a 2,000-ton train which moves 100 miles in 10 hours produces exactly the same number of ton-miles as a train of the same weight which is run the same distance in 7 hours. The gross revenue would be the same in each case, but the cost in the first case would be based upon 10 train-hours and in the second case upon 7 train-hours, and the cost per ton-mile in the second case would be substantially lower. Besides, there would be a theoretical saving of 3 hours in which the tracks could be used by other trains, a factor which has an important bearing when the traffic of a road has nearly reached the point of saturation.

Publication of Results

After deciding to enter upon a campaign for increasing the gross ton-miles per train-hour, the management's first move was quietly to post a chart in each engine-house, yard office, important station, and all operating department offices, showing graphically the total gross ton-miles and the gross ton-miles per train-hour by weeks during the year 1923 with the corresponding curve carrying the same information for the first month of 1924. After these charts had been posted several weeks, and had aroused some curiosity on the part of employees, the general manager, under date of February 14, 1924, issued a circular which called attention to the charts, explained what was meant by the statistical unit, and described how the basic data were computed. Then he added, "The efficiency of all railroads is being checked on their performance in gross ton-miles per train-hour and it is to the interest of the employees as well as the management that the Walworth Railroad make a very good showing. It is trusted that the men will watch these statements showing the improvements they are making week by week, and will do everything in their power to eliminate unnecessary delays on the line so as to increase the gross ton-miles per train-hour."

On March 4, 1924, the general manager issued a bulletin giving the figures for the first two months of 1924: January, 10,402; February, 10,349. In commenting on these figures he

suggested the objective of 11,000 gross ton-miles per train-hour.

On April 8, another circular was issued giving the figures for January, February, and March. For March the gross ton-miles per train-hour were 11,364 or 364 above the objective. The general manager then suggested that the objective be increased to 12,000. On May 12, the figures for April and the first week in May were posted. April had dropped off somewhat in comparison with March, but the performance during the first week in May was 11,799.

On June 9, the complete figures for May were posted:—first period, 11,799; second period, 11,551; third period, 12,303; fourth period, 11,383, an average of 11,721 for the month.

On July 7, another circular published the results for the month of June, the average being 12,402, with 12,918 in the fourth period of the month. After extending his congratulations on this performance, the general manager increased the objective to 13,000 and asked the cooperation of the men in attaining it.

On August 11, a circular was issued showing that the average for the month of July was 12,182, with a maximum of 12,576 in the first period. The figures for the month of August were posted on September 8. The average for the month was 12,500, with a maximum of 13,246 in the fourth period.

In nearly all of these circulars the employees were urged not to take chances by increasing the train speed beyond the maxima allowed under the local operating rules. Attention also was called to the fact that inasmuch as the increase in the unit was resulting in better service to the public, it should bring additional business to the railroad.

The complete figures for September, 1924, were not available at the time of writing, but an estimate indicated that the average would be slightly less than 13,000 although an estimate for the first period of October gave the figure clearly above the objective.

Employee Co-operation Secured

The result of this campaign was to bring about substantial reductions in the ton-mile cost of fuel, wages of engine men and train crews, and other train service items. It also had the effect of speeding up the movement of cars. The extent of the improvement in gross ton-miles per train-hour is shown in the chart. It will be noted that the increase in the unit has been accomplished with substantially the same volume of traffic.

The improvement was brought about by a better train load and by reducing the delays in getting the trains away from originating terminals; by reducing the time consumed in taking sidings, getting train orders, and other incidents connected with the road trip; and by reducing the delays from the moment of arrival at the entrance to the final terminal until the train was in the yard. The management was successful in securing real co-operation from the men in train and engine service, the yard men and the telegraph operators. The posting of the charts did more than arouse the curiosity of the men; they displayed a keen interest in the weekly additions to the curves. As the statistics were given in detail by operating divisions, competition arose between the divisions in their effort to show the greatest improvement.

An indication of the relative improvement is shown by a comparison of the operating results of July, 1924, with those of July, 1923. In 1923, the Walworth Railroad, in comparison with five other railroads in its own territory, produced the smallest number of gross ton-miles per train-hour. The Walworth's average was 9,833. For the other six roads the highest was 13,329 and the lowest 10,190. In July, 1924, the Walworth's average was 12,182, a better figure than three out of the six of the neighboring roads whereon the average ranged from 10,244 to 14,745. In car-miles per car-day the Walworth made a gain from 23.5 miles to 28.5 miles, whereas, on the neighboring roads, with but one exception, the performance in 1924 was less favorable than in 1923.

In fuel efficiency, expressed in the unit "pounds of coal per 1,000 gross ton-miles," the Walworth ranked third in July, 1923, and in July, 1924, it ranked first.

Reduction in Costs

During the first six months of 1924 the direct freight train expenses of the Walworth were \$1.392 per 1,000 gross ton-miles. The comparable expenses for the first six months of 1923 were \$2.039. The details are listed below.

Item	January 1 to June 30	
	1924	1923
Locomotive repairs	\$.231	\$.324
Train enginemen .....	.229	.312
Fuel for train locomotives .....	.503	.817
Other locomotive supplies .....	.018	.020
Enginehouse expenses .....	.079	.143
Trainmen .....	.270	.355
Train supplies and expenses .....	.062	.068
Total	1.392	2.039

The reduction in the cost of locomotive repairs was brought about in part by the use of a greater number of new locomotives in 1924 and by an improvement in shop morale which had been adversely affected by the shopmen's strike in 1922-23. The cost of fuel per ton-mile was favorably influenced by a slight reduction in the price of coal per ton. It should be noted also that the months of January and February, 1923, were marked by unusually severe snow troubles.

The significant items in the statistics of freight train service during the first half of the year 1924, compared with the performance during the first half of the year 1923, are shown in the following table:

OPERATING STATISTICS—WALWORTH RAILROAD FIRST 6 MONTHS OF 1924 AND 1923 FREIGHT TRAIN SERVICE

Item	January 1 to June 30		Per cent of change	
	1924	1923	Increase	Decrease
Gross ton-miles (thousands).....	581,538	566,293	2.7	...
Net ton-miles (thousands).....	227,016	220,843	2.8	...
Freight train-miles.....	519,261	584,236	...	11.1
Freight locomotive-miles.....	541,793	617,120	...	12.2
Freight car-miles (thousands).....	17,087	16,524	3.4	...
Freight train-hours.....	51,816	66,862	...	22.5
Tons of fuel consumed by freight locomotives.....	50,190	67,501	...	25.7
Cars per train.....	32.9	28.3	16.2	...
Gross tons per train.....	1,120	969	15.6	...
Net tons per train.....	437	378	15.6	...
Net tons per loaded car.....	19.1	19.2	...	.5
Train speed in miles per hour.....	10.0	8.7	14.9	...
Gross ton-miles per train-hour.....	11,223	8,470	32.5	...
Net ton-miles per train-hour.....	4,381	3,303	32.6	...
Net ton-miles per car-day.....	386	299	29.0	...
Car-miles per car-day.....	28.2	21.6	30.5	...
Coal (lbs.) per 1,000 gross ton-miles.....	150	204	...	26.5

The management in November, 1924, was continuing its efforts to make further improvements in the gross ton-miles per train-hour, believing that a concentration of attention upon that single unit would be more effective than a diffusion of effort on other related units. The improvement was not attributable wholly to the improved facilities. The general manager's estimate was that one-half of the improvement should be credited to the better facilities and equipment and that the other half was the result of the campaign of education and the success in securing the interest of the men in the statistics of operation.

Improvement Continued Into 1925

Before entering upon a discussion of the significant features in this case it may be well to examine the recent operating results and observe whether the campaign has been effectively sustained and whether the gains in efficiency have continued. The 1925 figures indicate that such is the case. The gross ton-miles per train-hour have continued to increase and the cost per gross ton-mile has continued to decrease. By months in 1925, up to and including November (the last month for which complete figures are available to me) the two units of performance and cost were as follows:

1925	Gross ton-miles per train-hour	Direct expenses per 1,000 gross ton-miles
January.....	11,320	\$1.490
February.....	11,684	1.349
March.....	12,642	1.232
April.....	12,602	1.234
May.....	13,288	1.083
June.....	13,067	1.106
July.....	12,673	1.155
August.....	12,913	1.185
September.....	13,017	1.251
October.....	13,754	1.133
November.....	14,225	1.195

The unit costs for the eleven months' period, in greater detail and in comparison with the same period in 1924, are shown in the next table:

DIRECT EXPENSES—FREIGHT TRAIN SERVICE PER 1,000 GROSS TON-MILES

Item	First 11 months of	
	1925	1924
Locomotive repairs.....	\$207	\$237
Train enginemen.....	.222	.222
Fuel.....	.380	.439
Other locomotive supplies.....	.018	.018
Enginehouse expenses.....	.077	.077
Trainmen.....	.259	.270
Train supplies and expenses.....	.045	.059
Total.....	\$1.208	\$1.322

A summary of the significant units in the statistics of freight train operation during the first 11 months of 1925 and 1924 shows the relation between those units and gross

ton-miles per train-hour. The figures are given in the next table. The volume of gross ton-miles in 1925 was 3.7 per cent greater than in 1924. The increase in tonnage as well as the expenditures for improvements had a favorable influence on the operating units and gross ton-mile cost, but the effect of those factors undoubtedly was substantially augmented by the sustained interest in getting a larger and larger ton-mile output for every train hour.

OPERATING STATISTICS—FREIGHT SERVICE

Item	First 11 months of		Per cent of change	
	1925	1924	Increase	Decrease
Cars per train.....	34.6	33.6	3.0	...
Gross tons per train.....	1,193	1,152	3.5	...
Net tons per train.....	474	449	5.6	...
Net tons per loaded car.....	19.3	19.4	...	.5
Train speed-miles per hour.....	10.8	10.2	5.9	...
Gross ton-miles per train-hour.....	12,860	11,726	9.7	...
Net ton-miles per train-hour.....	5,109	4,569	11.8	...
Car-miles per car-day.....	33.6	28.1	19.6	...
Coal (lbs.) per 1,000 gross ton-miles.....	127	139	...	8.6

The Importance of Employee Co-operation

The management of the Central Vermont Railway is to be congratulated upon its ability to bring about such gratifying improvements in freight train efficiency and in unit ton-mile costs. While it is true that additional facilities and heavier motive power have contributed a great deal (at least one-half) to the better operation, it is true also that the gains in efficiency would not have been so impressive if coupled with the additional facilities and better equipment there had not been a well conceived and well executed plan of securing and sustaining employee cooperation in the single unit of gross ton-miles per train-hour.

Therein lies the principal significance of this incident as a case for teaching purposes. It enables the instructor to give point to the principle that the time factor is almost if not quite as important as the load factor. We have been accustomed so long to measure transportation output on a train-mile basis that we often overlook the fact that the train-hour rather than the train-mile is the better unit of expenditure of effort against which the output should be measured. Speaking broadly, the expenses of train operation vary with hours rather than with miles, and in these days of heavy traffic, when transportation output may be limited by the capacity of the road, it is more important than in earlier years to make the most of that capacity by moving trains faster or with less road and terminal delay.

Emphasis upon the train-hour output does not neglect the load, but it does give equal weight to train speed. It places a premium on reduction in delays. While it places a premium also upon loading the train to the economical limit consistent with reasonable speed, it imposes an effective penalty upon overloading beyond that limit.

It is plain from the figures in this case that the improvement in the train output per hour was not purchased by a loss in the train output per mile. In the comparison of results during the first six months of 1924, the net train load was 15.6 per cent heavier than in the corresponding period of 1923, and in the 1925-1924 comparison there is shown a further increase of 5.6 per cent. The greater volume of ton-miles in the train-hour output were brought about not only by the greater load, but also by the increases in the average train speed from 8.7 miles per hour during the first 6 months of 1923, to 10.2 miles per hour during the first 11 months of 1924, and to 10.8 miles per hour during the first 11 months of 1925.

Nor was the betterment in speed purchased by fast running between stations or by chance taking. It should be noted that practically every bulletin on the subject emphasized the warning that speed restrictions should be rigidly observed and that no chances were to be taken. It is my understanding that this feature has been care-

fully watched. The improvement was brought about principally by the reduction of standby losses and through greater interest upon the part of and cooperation between train crews, dispatchers, operators, yardmasters and others having to do with train service.

Discussion in the Class Room

In the discussion of this case before a group of students the instructor would, of course, bring out the fact that unit costs might be sacrificed in striving unduly to increase the train-hour output. Underloading of trains to permit fast speed over grades; saving of road time by neglecting to pick up cars which could as well be taken, and other incidents of the kind, as well as uneconomical speed from the viewpoint of fuel efficiency, all would tend to increase the over-all cost per ton-mile. It is not difficult, however, to determine what is the critical point in a given case, nor to avoid going beyond it. In this case it is plain that the critical point was not exceeded, inasmuch as the direct expenses per ton-mile have been decreasing steadily.

The unique feature of this case lies in the method used to arouse the interest of the men. Ordinarily the management of a railroad could hardly expect enthusiastic cooperation from employees in any organized effort to bring down operating costs, the greater part of which consist of wages paid to the classes of employees affected. In this instance, however, the frankness of the management in placing the facts before those employees, and the policy of explaining the significance of the figures as well as the objectives of the campaign, have met with cooperative response. The success of the effort is a tribute to the general manager and his staff, as it indicates a commendable degree of mutual confidence.

I would be unfair to the Central Vermont as well as to other New England railroads if I should give you the impression that the Central Vermont is alone among its neighbors in accomplishing substantial improvements in freight train performance. The other roads too are making large gains. Such is the case. Yet that fact does not detract from the relatively larger increases on this road. In 1923 the Central Vermont was at the bottom of the list. It is not there now. In the year 1924, compared with 1923, the increase in gross ton-miles per train-hour for the entire New England region, was 17.3 per cent. On the Central Vermont alone the increase was 28.6 per cent. In the first 10 months of 1925, compared with the same period of 1924 the increase for all railroads in New England was 8.6 per cent. For the Central Vermont alone the increase was 9.7 per cent. However, it is not with the comparison between railroads that this case is concerned. Its peculiar significance lies in the conception and successful prosecution of a well organized plan for concentrating attention upon and securing employee interest in one index of performance. The importance and inclusiveness of that one unit are not generally recognized.

THE LOUISVILLE & NASHVILLE has filed a petition asking the Interstate Commerce Commission to be allowed until January 1, 1928, in which to determine and report to the commission whether it desires to make a second installation of automatic train control, under the commission's second order, of the same type as it has installed under the first order. The petition says the road has expended about \$350,000 under the first order for an installation of the Union Switch & Signal Company's train control device and that it should not be required to assume additional expense until it has been given an opportunity to ascertain whether the expenditure has been useful or improvident.

Appointments to I. C. C.

WASHINGTON, D. C.

SENATOR SMITH of South Carolina on January 27 introduced a new bill, S. 2808, providing for regional appointments to the Interstate Commerce Commission, which had been drafted by a sub-committee of the Senate committee on interstate commerce as a substitute for his earlier bill, S. 1547. Both bills provide for increasing membership of the commission to twelve, instead of eleven as at present, but whereas the earlier bill divided the country into four districts which should be given representation on the commission as vacancies occurred, the new bill would establish six geographical divisions: New England Group, Middle Atlantic States, Lake Group, South Atlantic Group, Gulf Group and Mountain Group, "in order that the various sections of the United States shall have representatives upon the commission in some degree commensurate with the extent and value of and the public interest in the railroad properties in such sections."

The bill provides for the appointment of an additional commissioner for a term expiring December 31, 1932, and that vacancies hereafter shall be filled by appointment from a division having no representative, or from a division having the least number of representatives, "in order to procure, as soon as practicable, the appointment of two representatives from each division." It also provides that not more than six commissioners shall be appointed from the same political party and that hereafter no individual shall be appointed a commissioner unless he shall have been, for at least six years prior to the date of appointment, a citizen and resident of a state included within the division from which he was appointed.

The proposed divisions are constituted as follows:

New England Group.—Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island.
Middle Atlantic States.—New York, Pennsylvania, New Jersey, Delaware, Maryland, Ohio, District of Columbia.
Lake Group.—Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Kansas, Nebraska.
South Atlantic Group.—North Carolina, South Carolina, Georgia, Florida, Virginia, West Virginia, Kentucky.
Gulf Group.—Alabama, Mississippi, Louisiana, Arkansas, Oklahoma, Texas, Tennessee, New Mexico.
Mountain Group.—Montana, Wyoming, Colorado, Idaho, Washington, Oregon, Nevada, California, Arizona, Utah.

Under this plan the first new appointment, that of the twelfth commissioner, would be made from the South Atlantic group, which includes Senator Smith's state, and, as the commission is now constituted, the next vacancy would be filled from New England or the Gulf Group, as each now has one commissioner, Eastman and Taylor, respectively.

The remaining groups now have each three commissioners, Cox, McManamy and Woodlock from the Middle Atlantic group; Esch, Lewis and Meyer, from the Lake group, and Aitchison, Campbell and Hall from the Mountain group. Commissioner Cox's term expires at the end of this year and Commissioner Esch's term at the end of 1927, after which there would be two expirations each year.

At a meeting of the Senate committee on interstate commerce on February 2 to consider the bill there was an almost unanimous vote in favor of the principle of the bill but as a good deal of difference of opinion arose as to the allocation of states to the six districts proposed it was decided to postpone the matter with a view of possibly holding hearings on the bill.



The Center Aisle of the Car Rack with the Locomotive Equipment at the End of the Aisle—This Shows the Brake Pipe Above with the Hose Connections Between Cars, the Brake Cylinders and Yokes and Oak Blocks for Obtaining the Various Lengths of Piston Travel—Car Equipments from No. 1 to 50 Are Shown on the Right and from No. 51 to 100 on the Left.

Power Brake Investigation Now Making Rapid Progress

Satisfactory recording instruments and test equipment developed—Type K triple valve tests 70 per cent completed

THE American Railway Association is now making rapid progress in its investigation of power brakes and power brake operating appliances for freight trains on a 100-car test rack located at Purdue University, Lafayette, Ind. These tests, which are being carried out under a plan laid down by H. A. Johnson, director of research, were started November 30, 1925, and will continue until all power brake equipment under consideration have been tested. After experiencing considerable difficulty satisfactory trainagraph instruments which practically eliminate the human element in recording original data have been developed and the Type K triple valve tests are about 70 per cent completed.

In making the tests, the director of research was instructed by the Committee on Safety Appliances of the Mechanical Division to proceed upon the following plan:

1. Steps will be taken to obtain appliances, which, it is claimed, meet the views of the Interstate Commerce Commission, as indicated in its preliminary report and conclusions. If the plans or specifications for such appliances are available and the appliances are not yet being manufactured, steps will be taken by the director of research to secure such appliances, even to the extent of entering into an agreement to have such appliances made.
2. As soon as such appliances have been obtained they will be given exhaustive tests on the test rack at Purdue University, which rack will be completely prepared and brought up to date for the purpose of this investigation.
3. Following the completion of the rack tests such devices will be given road tests, to develop whether or not they meet road conditions safely in service.
4. This program will be carried out with all dispatch and as promptly as the devices for these tests are available.
5. The investigation will also embrace such further study as may, in the judgment of the director of research, throw further light upon this problem.

Progress of the Work

In accordance with the above plan, inquiries were addressed to the air brake manufacturers to ascertain if they would design and build air brake equipments which would meet the views of the Interstate Commerce Commission. In response to these inquiries two air brake manufacturers, the Automatic Straight Air Brake Company and the Westinghouse Air Brake Company, agreed to furnish such equipments, and in February, 1925, the American Railway Association placed an order with each of these companies for 150 sets of freight train air brake equipments for trial purposes. The Westinghouse Air Brake Company will also submit a second air brake equipment embodying its views as to the desirable functions of an air brake equipment for modern freight train operation.

Ever since the orders have been placed, the manufacturers have been busily engaged in designing and building the equipments which they intend to submit. Up to the present time neither of the manufacturers has submitted its apparatus. It is anticipated that the Automatic Straight Air Brake Company will be ready to ship its equipment during the month of February 1926, and that the Westinghouse Air Brake Company will ship its equipment shortly thereafter.

In the meantime the test rack has been completely rebuilt, the new recording instruments designed and installed, a basic schedule of tests developed and agreed upon by the various parties concerned in the investigation and tests started.

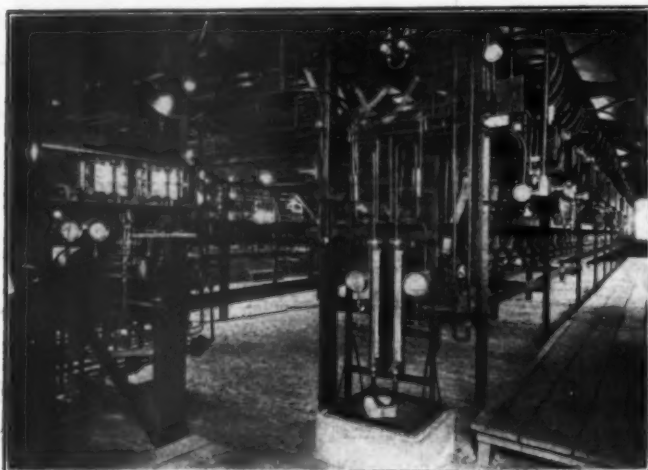
It was decided to make the same tests with the present standard air brake equipment for freight trains, known as

Westinghouse Type K, as will be made with the new equipments, in order

1. To obtain accurate information concerning the functioning of this equipment,
2. To establish its advantages and short-comings,
3. To obtain a basis with which the new equipments will be compared so as to determine whether such new equipments represent sufficient progress in the art of train braking to warrant their adoption.

Preparing Test Rack for the Investigation

The American Railway Association air brake test rack is located in a separate building approximately 35 ft. wide by 100 ft. long adjacent to the testing laboratories at Purdue University. It consists of two main parts, the locomotive rack and the car rack. It was necessary to dismantle the locomotive rack and move it to a new location in order to provide more space for the new sections of the car rack. The old locomotive equipments were replaced with two new type No. 6-ET locomotive brake equipments,

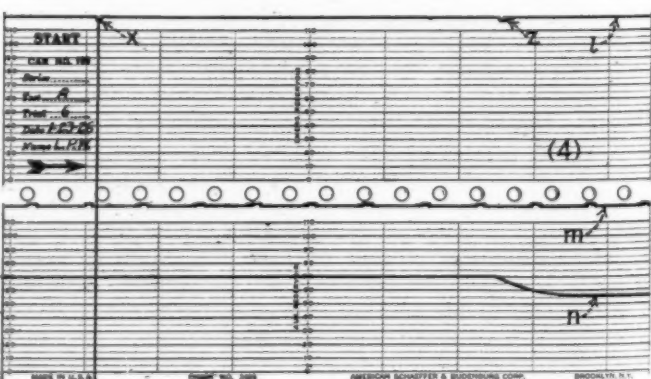
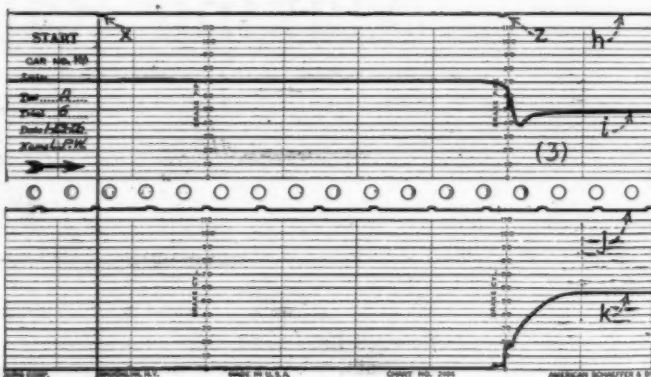
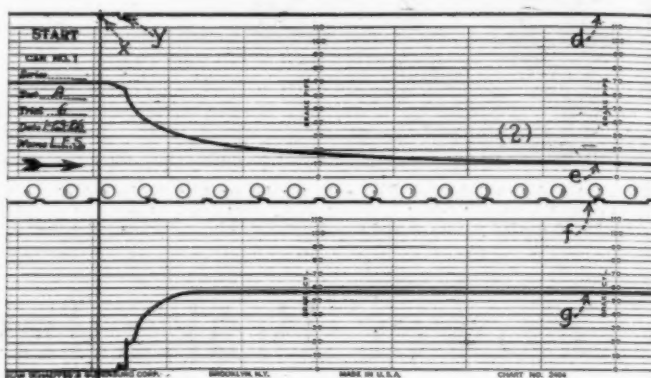
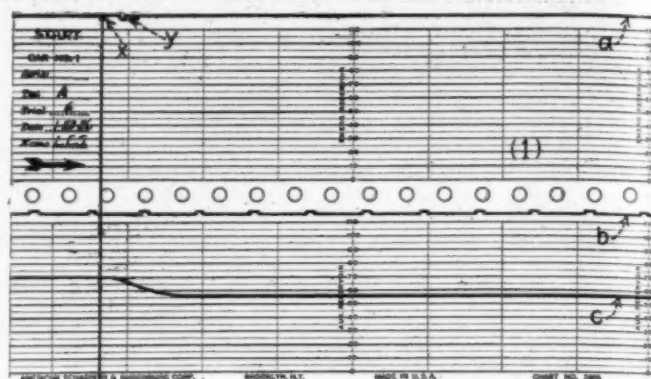


At the Extreme Left Is Shown One of the Special Locomotive Trainographs, Which Is Similar in Appearance to the Car Trainographs—In the Center Foreground Can Be Seen the Mercury Manometer at Car No. 100—At the Extreme Right a Good View Is Obtained of the Instruments and Equipments on Cars No. 51 to 100

which are so installed that one or both locomotives may be used in the tests. Two new 8½-in., 150 cubic ft. cross compound air compressors were installed near the locomotive rack and were so piped that either or both compressors could be used.

The old car rack, of sufficient size to accommodate 100 type K brake equipments, was not large enough for the new brake equipments which are to be tested. It was necessary to add four new sections to the car rack, and equipments were arranged so that there would be five brake equipments in each section. During this rearrangement of equipments, all piping was taken off the rack, hammer tested, blown out, replaced on the rack and blown out again. All brake cylinders were taken off the rack, cleaned, checked for wear, new packing cups installed and cylinders re-lubricated. All reservoirs were blown out and checked for leaks. The length of brake pipe per car was increased from 42 ft. to 50 ft., since the latter figure represents present day conditions in freight equipment. All hose and gaskets were replaced with new material. In other words, the entire rack was given a complete overhauling.

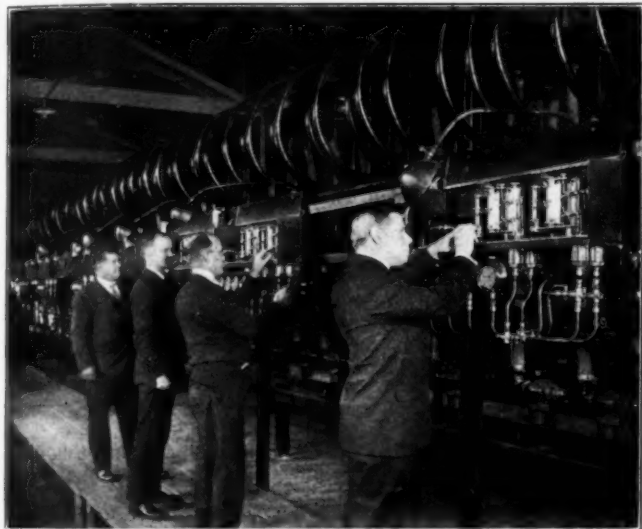
A new recording trainograph was developed for this investigation. Each trainograph is driven by a 110-volt,



Record of Brake Action in Emergency Application on Cars Nos. 1 and 100 with Westinghouse Type K 10-in. Freight Equipments on the Purdue Test Rack

Trainograph Charts (1) and (2) Record Brake Action on Car No. 1. Charts (3) and (4) Record Brake Action on Car No. 100. Reference Letters a, d, h and e Are Event Lines; b, f, j and m Are Time Lines, with the Distance between Each Notch Representing One Second; c, e and g Are the Auxiliary Reservoir, Brake Pipe and Brake Cylinder Pressures Respectively on Car No. 1; i, k, and n Are the Brake Pipe, Brake Cylinder and Auxiliary Reservoir Pressures, Respectively, on Car No. 100. Points z Indicate Brake Valve Movement; Points y, Initial Piston Movement on Car No. 1, and Points z Initial Piston Movement on Car No. 100.

60-cycle alternating current synchronous motor, so that all trainagraphs operate at the same speed. Each instrument has four pressure pens and four time pens. The four pressure pens automatically record the pressures in the brake pipe, brake cylinder, auxiliary and emergency reservoirs. Two of the time pens are electrically connected to a master clock and automatically indicate seconds on the charts, while the other two pens indicate on each chart the movement of the brake valve handle either to the service position or release position, whichever is desired. Since the brake valve event occurs at the same instant on all instruments, means are hereby pro-



(Right to left) H. A. Johnson, Director of Research, A. R. A., Professor Harry Robenkoenig, Purdue University, W. S. Helmer, Engineer Power Brake Investigation, A. R. A., and Professor G. A. Young, Head of the School of Mechanical Engineering, Purdue University, Shown Adjusting a Group of Car Trainagraphs. In the Instrument in the Foreground, the Alternating Current Synchronous Motor, the Two Charts, Gages and Copper Pipe Connections Can Be Plainly Seen

vided for synchronizing all charts to a common starting point, the movement of the brake valve to the operative position.

For example, on the trainagraph charts illustrated, which show brake action in emergency application on cars No. 1 and 100 with Westinghouse type K, 10-in. freight equipments on the test rack, the four points *x* all on the same vertical line show the point of brake valve movement on each chart. Points *y*, indicating the initial piston movement on car No. 1 occur .4 second later than the brake valve movement. The gradual reduction of auxiliary reservoir pressure to 57 lb. is shown on line *c*. Brake pipe pressure drops more rapidly to a low point of 10 lb. as indicated by line *e*. Brake cylinder pressure builds up almost instantaneously with the first injection of air from the brake pipe and then more gradually as it equalizes with the auxiliary reservoir pressure at 57 lb. Points *z* indicating the initial piston movement on car No. 100 are observed from the chart to occur 7.1 seconds after the movement of the brake valve handle or, in other words, the brake on car No. 100 sets 6.7 seconds after the brake on car No. 1 sets. The variation in brake pipe, brake cylinder and auxiliary reservoir air pressures on car No. 100 can be accurately determined from an examination of lines *i*, *k* and *n*.

On eight cars distributed throughout the 100 car train the brake cylinders are equipped with circuit breakers so arranged that the electrical circuit is momentarily broken

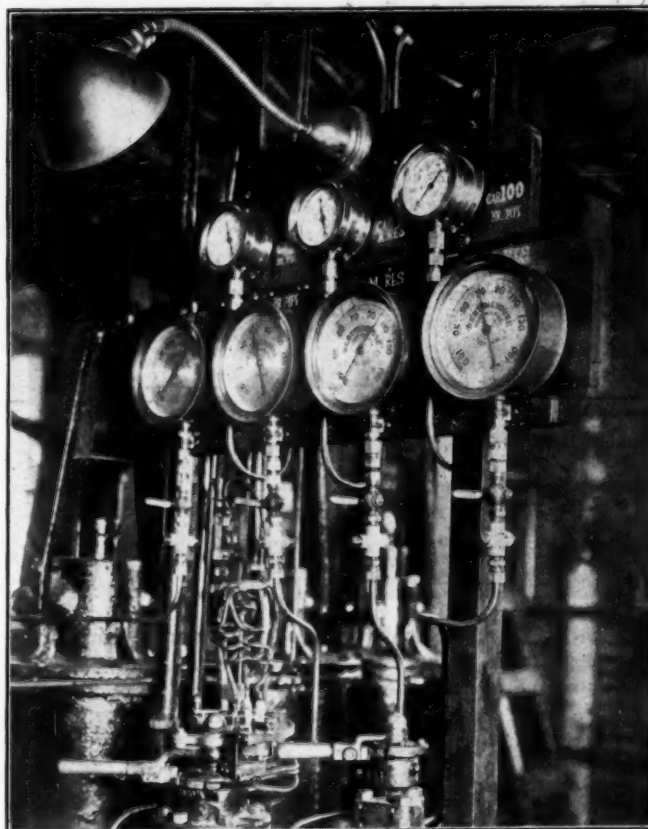
when the brake cylinder piston starts to move to application position and is again momentarily interrupted when the piston returns to release position. The operation of each of these circuit breakers makes an indication on the record chart for its respective car of the exact instant its brake cylinder piston started to apply and again when it returns to the release position.

A special locomotive trainagraph instrument was also developed to show at all times the position of the brake valve handle. This instrument also automatically records the pressures in the main reservoir and equalizing reservoir of the locomotive and the brake valve event as explained above for the car trainagraphs.

Thirty-four car trainagraphs and two locomotive trainagraphs have been built and have been installed on the test rack.

Five gauges have been installed at each car equipped with a trainagraph for the purpose of checking the pressures shown by the instrument. All gages and trainagraphs have been calibrated and calibration curves prepared.

Mercury manometers were built and installed on cars No. 50 and 100 for the purpose of accurately measuring



Close-up of the Gages at the Brake Valve Operator's Position —The Special Electric Wiring for Recording the Movement of the Brake Valve Handle Can Be Seen on the Upper Part of the Automatic Brake Valve

the brake pipe pressure at these cars in pounds per square inch and tenths thereof.

Three large storage batteries furnish direct current at 6 volts, 12 volts and 24 volts needed for the operation of the trainagraphs and the 110 volt alternating current is furnished by the University power plant. A very extensive system of electric circuits was installed on the car rack not only for lighting, but also for operating the trainagraph motors, the time and event pens and a trainagraph operator signal system. All of this wiring was installed

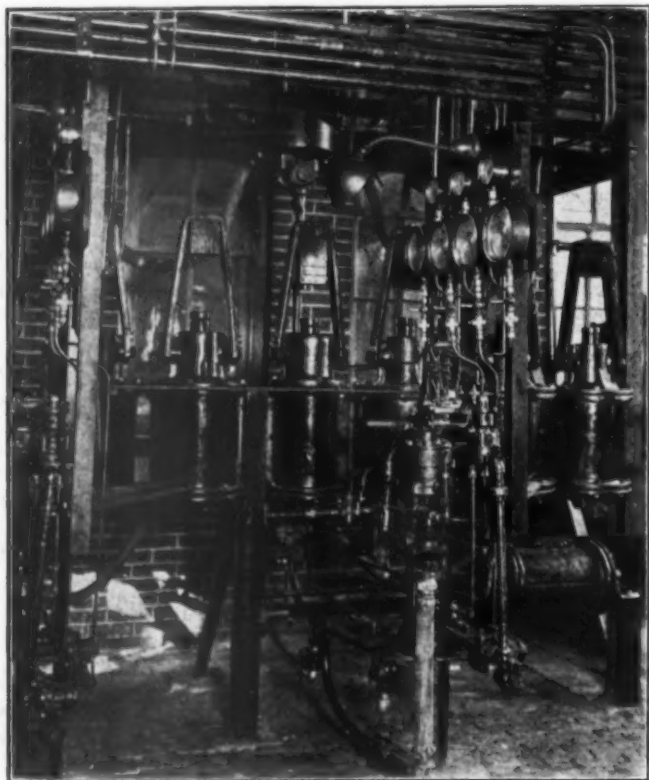
in metallic conduit with approved switches and outlet boxes.

After all the piping and equipment had been installed, the brake pipe leakage for the 100-car train was reduced to less than 2 lb. per min. The leakage of each brake cylinder was also reduced to less than 2 lb. per min. In certain tests, however, artificial brake pipe leakage of 7 lb. per min. and artificial brake cylinder leakages of 5 lb., 12 lb., and 17 lb. per min. will be created by means of fixed orifices.

The Basic Schedule of Tests

The first draft of the basic schedule of tests was sent to the following parties, who are concerned in this investigation, in the month of July, 1925.

W. P. Borland, director of the Bureau of Safety, In-



Part of the New Locomotive Rack; the Automatic and Independent Brake Valves of Locomotive No. 2, Are Shown; also the Locomotive and Tender Brake Cylinders, Gages, Vent Valve and Piping

terstate Commerce Commission, Washington, D. C.; H. I. Miller, vice-president and general manager, Automatic Straight Air Brake Co., New York, N. Y.; C. C. Farmer, director of engineering, Westinghouse Air Brake Company, Pittsburgh, Pa.; C. E. Chambers, chairman, Committee on Safety Appliances, Mechanical Division, American Railway Association; and V. R. Hawthorne, secretary, Mechanical Division, American Railway Association, for transmittal to the members of Committee on Brakes and Brake Equipment. Shortly thereafter conferences were held with each of these parties to ascertain their criticisms and suggestions for new tests.

After all of these suggestions had been included in the second draft of the basic schedule of tests, it was again sent out in October, 1925, to the parties referred to above for further criticisms, suggestions or approval. This draft was approved with some suggestions for additional tests. The basic schedule of tests is divided into the following main headings:

- 1.—Individual triple valve tests. (Single car.)
- 2.—100-Car train—level road conditions,—direct release.
- 3.—100-Car train—grade conditions—graduated release or retainers.
- 4.—50-Car train—grade conditions—graduated release or retainers.

The basic schedule of tests contains 565 separate tests which is indicative of the scope and extensiveness of this investigation. All equipments under consideration will be run through each test in this schedule. A large number of the tests in this schedule have been designed to reproduce conditions which are met in actual freight train service. The making of these tests in the research laboratory will result in the shortening of the time required to make the road tests.

The following freight train equipments will be tested on the rack.

1. Standard type K triple valves in order to determine the exact functions of present standard brakes for a basis of comparison with the new brake systems which will be tested.
2. Type K triple valves with heavier-than-standard graduating springs to determine the effect of these springs upon the functioning of the K triple valves.
3. Automatic Straight Air Brake equipment.
4. Mixed equipments of standard type K triple valves and Automatic Straight Air Brake equipments.
5. New Westinghouse air brake equipments, which, in this company's opinion, meet the views of the Interstate Commerce Commission.
6. Mixed equipments of standard type K triple valves and new Westinghouse equipments.
7. A second new Westinghouse equipment embodying this company's views as to the desirable functions of an air brake equipment for modern freight train operation.
8. Mixed equipments of standard type K triple valves and the second new Westinghouse equipments.

Personnel of Rack Tests—Completion

An organization of trained men has been built up to carry on the test work. This organization at the present time consists of thirty men, all of whom have been especially picked out for this work. No University students are being employed. The testing is being carried on continuously working 44 hours per week. While one force of men are making tests on the rack, another force of men are compiling the results from the records made in the research laboratory.

Representatives of the Interstate Commerce Commission are present in the research laboratory at all times during the conduct of the tests. The air brake manufacturers have been invited to send representatives to be present not only during the testing of their own equipments, but also during the testing of the other brake equipments under consideration.

From the time being taken to test out the equipments under the first and second series, namely, the standard type K brake equipments and the type K brake equipments with the heavier-than-standard graduating springs, an estimate of approximately two months per equipment can be made. At this rate it will take practically all of the year of 1926 to complete the rack tests. Methods for reducing the time required to test an equipment are now under consideration.

THE HARDWOOD MANUFACTURERS' INSTITUTE will consider revised grading rules, improved marketing methods, the problem of insurance, a broadening of trade extension work, greater co-operation of the manufacturers in developing statistical information, a more thorough knowledge of costs and yields, and an industrial and commercial research bureau, at its fourth annual meeting to be held in New Orleans, La., on February 2 and 3. Arrangements are being made to operate a special train from Memphis, Tenn., to New Orleans and return.

The Potter Plan as a Pool

*Writer contends that plan finds its prototype
in early railway pools*

By J. Shirley Eaton

THE plan for relief of the western carriers proposed by Mark W. Potter, formerly Interstate Commerce Commissioner, and now one of the receivers for the Chicago, Milwaukee & St. Paul, calls for a 5 per cent increase in rates and the pooling and distribution of the proceeds among the several carriers in the proportion that they severally fall short of the $5\frac{3}{4}$ per cent net railway operating income designated as the fair return.

In the discussions of this plan, there have been advanced a very miscellaneous array of objections. Some of these can hardly be based on mature consideration. Especially may this be true when it is charged that the plan is in itself socialistic. Those who would dismiss the proposition merely because this charge has been bandied against it may have a rude awakening. An issue so momentous as this will be decided by searching criticism and informed and deliberate judgment, and not by careless accusation. The proposition calls for intensive, candid consideration and not merely for quick reactions.

The Potter plan is primarily a pooling plan. American railways are not unfamiliar with pools. Prior to the original Interstate Commerce Act of 1887, pools were general among carriers. The public distrusted them but the railways cultivated them. However, neither friend nor enemy saw fit to call them socialistic. These pooling practices offer a test of experience which should not now be overlooked in discussion of the Potter plan.

The Omaha Pool

The first notable railway pool was the Omaha Pool formed by the Chicago, Burlington & Quincy, the Chicago & North Western and the Rock Island in 1870. Barring one suspension, this pool was in continuous operation until 1882, when it was merged into a larger pooling arrangement. In 1869, three railways—the Pennsylvania, the New York Central and the Erie—had completed their lines by single ownership or operating continuity from the seaboard to Chicago. Hitherto railroad traffic was mostly local, but the exigencies of the Civil War had taught the railways how to link short lines into an extended system. There now emerged the conception of a through business to which the several carriers all had access. In 1874, the Baltimore & Ohio reached Chicago. From that time there was a mad scramble to share the scant through traffic. The missionary freight car, the through freight line, and the lines soliciting agencies came to exercise furious pressure in the strife for this business.

The Saratoga Conference

Little was known about the possibilities of "getting together." There was a terrific rate war in 1876, ended by the famous Saratoga conference in 1877 between Mr. Vanderbilt and the representatives of the other lines. Certain engagements were made at that time only to be quickly broken. But the foundation for co-operative action had been laid. The idea slowly emerged that the traffic for which all fought, and to which all had access, by this very circumstance could only be handled logically in a group way. All unconsciously, under the pressure of emergency, competing carriers came to deal with this

through traffic as an entity, regardless which carrier performed the actual service.

Southern Railroad and Steamship Association

What was true in the regions to the north and middle west was also coming to be understood in the region south of the Ohio and Potomac and east of the Mississippi. The lines here found themselves prostrated after the war. The first resource to any carrier, in order to expand its revenue, lay in seizing upon through business. Prick of necessity drove each into reckless rate cutting in its efforts to get its share. For some lines, there was no outlook but bankruptcy. In 1873, three competing carriers out of Atlanta came together and agreed upon a division of the cotton business to the north and east. This was the first gesture. In 1874, followed a series of conferences of many lines to find a way out of the furious rate wars. The result was that the next year a general division of business was agreed upon by most of the carriers in that region. Finally, in October of the same year Albert Fink left his post on the Louisville & Nashville to organize the whole movement under the name of the Southern Railroad and Steamship Association. Under Mr. Fink's initial leadership this association speedily became a power embracing practically all of the lines in its territory.

Following these beginnings, the pooling idea took hold generally among the railways of the country. A large number of pools were set up. Most of the early pools were tonnage pools by which the through competitive traffic was apportioned on agreed percentages among the several competitors. Certain big shippers were designated as "eveners," to make the diversions necessary to protect these quotas against irregularities in the flow of traffic. But besides the tonnage pools, there were "money pools." Some of these money pools divided the gross revenue of the pooled traffic and some divided the net revenue, after deducting a constructive allowance to cover the costs of handling.

The traffic handled by the pool was dealt with as a whole. Each carrier on the basis of previous performance, modified by any other potential considerations that were allowed, shared the total traffic at a stated proportion of this whole. Whatever the shifts of traffic, the failures or abundance of crops, or the results of solicitation that upset these proportions, the original percentages allotted were maintained either in actual tonnage (through the evening devices of the pool) or through the net money pool they were maintained without the necessity always of actually hauling the tonnage.

Quotes from Railroad Gazette

The prime purpose of these early pools was to stabilize earnings through the stabilization of rates. The Interstate Commerce Commission, under the law, now performs this function, so that in this respect pools are not necessary. But there were secondary effects noted in the early pools which are the results now specifically sought under the Potter plan. Thus, it was found that the pool also stabilized the earnings of the individual carriers against ir-

regularities in the flow of business. As expressed editorially by the *Railroad Gazette* at that time, "The general effect is that these co-operating roads provide a system of mutual insurance against certain of the inevitable vicissitudes of traffic."

The idea of the stabilizing effect of pools in this respect was well fixed in the minds of the railway officials of that time. For instance, three years later when railways were trying to conserve the advantages of the pool in face of the specific prohibition of pools by the Interstate Commerce Act of 1887, which had been enacted in the meanwhile, the *Railroad Gazette*, alluding to the difficulty of enforcing the law against them, said "If officials of several roads think that their traffic can be more advantageously handled by securing certain propositions so that the danger from a deficiency is greater than the advantage from the corresponding excess, it would be hard to convict them of misdemeanor as long as they keep within the letter of the act, however much they may violate the spirit of it." And five years after the pools had been legally disestablished, the idea still echoed in the railroad mind,—"The pool provides for a recompense in the future, for loss of traffic now." So far was this idea of the stabilizing effect of pools and of traffic as an entity developed in the minds of those who were dealing with the problem, that G. R. Blanchard, commissioner of several pools, in an extended treatment of the subject, designated his brochure "Traffic Unity," advancing the idea that the pool might extend its co-operative effects to include local traffic.

Community of Service

Since the days of the early pools, the body of through traffic has enormously expanded. At the same time, commercial conditions on which all traffic rests, both through and local, are more closely interrelated. By the competitively maintained balances throughout all industry and commerce, these conditions are more delicately responsive to influences that may be widely removed geographically. In consequence, the former sharp distinction between local and through traffic is no longer so sure and precise. The entire body of traffic is very much of a whole and over extended regions must be treated as such.

Not only is there now enforced stability in the rates, but there is broader economic purpose in the rate structure itself that envisages the whole body of production without regard to state boundaries and the limits of individual carriers. Of this aspect, the Supreme Court in the Minnesota rate case leaves us in no doubt—"The full control by Congress of the subjects committed to its regulation is not to be denied or thwarted by the commingling of intrastate and interstate operation." And as to the interrelation of the carriers themselves, the Supreme Court in the Dayton-Goose Creek case declared "The new act (Transportation Act, 1920) seeks affirmatively to build up a system of railways prepared to handle promptly all the interstate traffic of the country." Or, as the Supreme Court expressed it in the State of Wisconsin vs. the Chicago, Burlington & Quincy, "Congress in its control of its interstate commerce system is seeking in the Transportation Act to make the system adequate to the needs of the country. . . ." And by these stages the court opinion advances to the point where the body of shippers are brought to confront all carriers of a region as a whole and support them. As expressed in the Dayton-Goose Creek case, ". . . the individual shipper . . . with every other shipper similarly situated in the same section is vitally interested in having a system which can do all the business offered. . . . He may, therefore, properly be required in the rates he pays to share with all the other shippers in the same section the burden of maintain-

ing an adequate railway capacity to do their business."

Thus have individual carriers been gathered up in a community of service and solidarity of interest.

The Public Interest

The public interest is better understood and more emphasized today than it was in the days of the early pools. These pools featured solidarity of interest even among hostile competitors but they did not particularly concern themselves with the community of service. In this solidarity of interest, those pools abolished the making and unmaking of rates in the merely local and pressing interest of the single carrier but they omitted too often to make or unmake them in the interest of the community served. The fact that the control of rates is now the definite function of public regulating agencies does not mean that essential property rights are violated or mitigated. On the contrary, they are more precisely defined and so far, more securely established. But the right of individual action is more tempered with consideration for the rights of individual action of others. There is now a more embracing co-operation. It includes not only the other carriers in the pool but to the extent that rates shall be definitely fair and reasonable, and that the rate structure shall not lend itself to uneconomic production, this co-operation embraces also the shippers and consumers.

In co-operation we forego the individual, accidental advantage for a larger consideration of general good in which we share. There can be no co-operation without this subordination in some degree of the part to the whole. In the days of the early pools, the earnings for each carrier were within the limits of its allotment. Each carrier's right to profit by some shift of circumstance or even by its superior power in some one period to draw traffic in excess of its quota was given up in order to assure a general stability in which it shared. "Earnings" under such conditions had lost some of their first quality of a private property directly acquired. They were a property acquired under certain co-operative terms. For such "earnings" the individual carrier had to account to all the other carriers in the pool, and if need be the strong had to make over to the weak. In light of the larger need for stability of earning power, the carriers struggled hard for the right to pool and lost it.

In analyzing these early pools, we find that the underlying principle was the regulation of each road's individual operations by consideration of the needs of the group as a whole. There was group determination of the quota of the individual road. In effect, to the extent of the group, this was "social control" of the earnings of the individual road. The relations one with another were cleared through a commissioner acting for the group as a whole. Each road vigorously maintained its quota. It is the testimony of traffic officials of those days that individual managements worked for the pool as they did for their individual railroad. There remained the competition to rearrange quotas—the battle of the quotas, as it were—but it was a constructive and not a destructive competition. Each competitor strove strenuously to perform and extend the service it was best fitted to perform. All that it did was under scrutiny of the commissioner acting for all. Aside from the pressure maintained by the commissioner steadying the practices of the individual carrier, the motive for wasteful and destructive competition was largely removed. Constructive competition to make a record against the next assignment of quotas by performing alertly and efficiently the service the carrier was best fitted to perform, did not carry it over into wasteful practices to protect existing business already protected by the terms of the pool.

In the light of such experience, it is unaccountable that the carriers of today are so ill prepared to understand and

accept the social control of earnings under the present law.

The Transportation Act, 1920, has now restored the right to pool, but the carriers regard it with a certain dismay much as a discharged prisoner might look upon regained freedom. Of course, the right to abuse the power to pool has been taken from them, but they strangely hesitate to seize upon the large advantages that yet remain to them by reducing useless competitive wastes. To stabilize the earnings of individual carriers, to assure dependable efficient service, to reduce transportation wastes and discourage uneconomic production is what the Potter plan is specially fitted to do. There are no longer violent rate wars but there is wasteful instability in transportation. There are cross hauling and circuitous routing and duplication of service to a cruel degree. There are uneconomic productions in industry directly promoted by ill-advised rate structures and service. Neglected possibilities for saving by co-operative efficiency are enormous.

One of the outstanding features of the Transportation Act as we have seen is the treatment of traffic as a whole within designated regions. But although the traffic itself may be an entity this traffic entity is handled by many different and entirely distinct corporate and operating entities, each with a property to be protected by common law and constitutional right. To make the law finally workable the pooling device must be used.

The early pools dealt with designated traffic as an entity and yet successfully conserved the while the rights of the individual carriers that handled this traffic. The Potter plan does the same, except instead of pooling 100 per cent of the traffic designated, it pools but five per cent of the freight revenue which in turn amounts to but a fraction over three per cent of the entire gross revenue. The basis of the apportionment in the early pools was the power of each road to control tonnage. The basis of the apportionment under the Potter plan is the actual power to handle traffic, namely the railway plant itself as indicated by the property at its valuation. In case of the net money pools there was a crude, arbitrary allowance made for expenses. Under the Potter plan operating within the present law the expenses allowed are actual expenses. All costs in excess of those of "honest, efficient and economical management" and reasonable expenditures for maintenance are disallowed by a specific mandate of law.

The Transportation Act, 1920, as now affirmed in vital particulars by the Supreme Court, is the law of the land. In theory it is based upon the broadest justice and widest economic expediency of all interests involved. The Potter plan is merely a device under this law, in the light of the best experience of years past, to stabilize operations, assure a continuous, effective transportation service and promote railway credit. It is no more socialistic than life insurance or fire insurance or any other of the two score or more kinds of insurance now running to the aggregate of billions of dollars of policies and established as an elementary principle of good business practice.

Conductors and Trainmen Seek 20 Per Cent Increase

GENERAL chairmen of the Order of Railway Conductors and the Brotherhood of Railroad Trainmen on February 2 presented to the railroads demands for wage increases in train and yard service averaging about 20 per cent over existing scales and ranging from about 15 per cent in the case of passenger conductors to more than 27 per cent in the case of passenger trainmen. Several important changes in working rules are likewise asked for. A reply in writing is requested from the railroads on or before March 2.

Other groups of employees are also said to be preparing similar demands for wage increases, but these have not yet been presented to the railroads. For the 12 months ended October, 1925, train and engine wages in road and yard service totaled approximately \$754,000,000. Increases of 20 per cent in wages for this whole group would, therefore, raise the railroad wage bill some \$150,000,000 per annum. For the train service men alone—omitting the enginemen, who have not yet presented any wage demands—the increase in expense to the railroad on the same basis would be, probably, somewhere between \$80,000,000 and \$90,000,000. A similar increase to all employees would increase expenses about \$580,000,000, with business on a 1925 basis.

The detailed demands, as presented by the Order of Railway Conductors and the Brotherhood of Railroad Trainmen, follow:

PASSENGER SERVICE

	Rate per mile	Day	Month
Conductors .....	.05166	\$7.75	\$232.50
Assistant conductors and ticket collectors.....	.0456	6.84	205.20
Baggagemen handling express, dynamo and government mail .....	.04786	7.18	215.40
Baggagemen handling dynamo and express.....	.0456	6.84	205.20
Baggagemen handling dynamo and government mail .....	.0456	6.84	205.20
Baggagemen handling express and government mail .....	.0456	6.84	205.20
Baggagemen handling either dynamo, express or government mail.....	.04333	6.50	195.00
Flagmen .....	.041	6.16	184.80
Flagmen and brakemen.....	.04	6.00	180.00

Note—Where flagmen or brakemen are required to handle baggage, express, dynamo and government mail, or either of them, the same differential as applies to baggagemen will be added to their rates.

For service paid local or way freight rates under schedules now in effect the rates shall be as follows:

	Rate per mile	Per day
Conductors .....	.0774	\$7.74
Brakemen .....	.0624	6.24

For service paid the through freight rates under schedules now in effect, the rates shall be as follows:

	Rate per mile	Per day
Conductors .....	.0734	\$7.34
Brakemen .....	.0584	5.84

NINE YEARS OF TRAIN SERVICE WAGES

Employees	Average daily rate Dec. 1917	Average daily rate U. S. R. A.	Rates resulting from Decision No. 2 retroactive to May 1, 1920	Rates resulting from Decision No. 147 effective July 1, 1921	Present Rates,* effective 1924	Rates demanded	Per cent of demands over present rates	Per cent of demands over 1920 peak rates
Yard—								
Conductors or foremen.....	\$3.77	\$5.34	\$6.96	\$6.32	\$6.64	\$7.64	15.1	10.0
Brakemen or helpers.....	3.42	5.01	6.48	5.84	6.16	7.16	16.2	10.5
Road freight—								
Conductors—Through	4.08	5.40	6.44	5.80	6.16	7.34	19.2	14.0
Conductors—Local	4.47	5.92	6.96	6.32	6.68	7.74	16.0	11.2
Brakemen and flagmen—Through.....	2.75	4.08	5.12	4.48	4.84	5.84	20.7	14.1
Brakemen and flagmen—Local.....	3.00	4.48	5.52	4.88	5.24	6.24	19.1	13.0
Road passenger—								
Conductors	4.45	6.00	7.00	6.40	6.70	7.75	15.7	10.7
Baggagemen	2.75	4.16	5.16	4.56	4.86	6.16	26.7	19.4
Brakemen and flagmen.....	2.59	4.00	5.00	4.40	4.70	6.00	27.6	20.0

*These rates, the so-called New York Central basis, were granted by most Class I roads on various dates in 1924. On a few roads the Decision No. 147 rates are still in effect.

YARD SERVICE	
Car retarder operator.....	Per day \$8.44
Foremen	7.64
Helpers	7.16
Switchtenders	5.72
Corresponding increases to be added to the present rates of pay for yardmasters and assistant yardmasters.	

Other Service

1. The same increases shall apply to milk, mixed, work, miscellaneous or any service not enumerated as are applied to the service in which they are now classified. Where there is a separate rate for milk, mixed, work, miscellaneous or other service, it shall be increased in the same amount of money compared with rates in effect this date, as the freight or passenger rate, according to the over-time basis on which it is calculated.
2. All rates of pay in excess of standard rates and all mountain, desert or other differentials to be maintained—that is, the same amount of money now paid in excess of standard rates to be paid in excess of rates which may be agreed upon.
3. The adoption of the rates suggested shall in no case operate to bring about a reduction in compensation now paid.
4. Literal application of the following language: "In all classes of service, trainmen's time will commence at the time they are required to report for duty, and shall continue until the time they are relieved from duty."
5. A through freight train is one that neither sets off nor picks up cars nor loads or unloads freight enroute, nor does station switching. On all other freight trains trainmen shall be paid not less than local or way freight rates.
6. Not less than one brakeman shall be assigned to every passenger train of two or more cars or on other passenger trains of less than two cars that carry either baggage, mail or express matter for distribution.
7. All rates and rules herein enumerated to be effective as of January 1, 1926, except where agreements in effect have been made to a later date.

An accompanying table shows the changes in the wage rates since the month prior to federal control of the principal classes of employees joining in the demands.

Commissioner Hall Discusses Consolidation Bill

WASHINGTON, D. C.

A SUGGESTION that "adequate service" rather than "the lowest rates" should be recognized as the primary purpose of railway consolidation, and that the country must face the possibility of increases in rates and a higher rate of fair return than the 5¾ per cent now fixed by the Interstate Commerce Commission, was given to the Senate committee on interstate commerce on January 28 by Commissioner Hall of the Interstate Commerce Commission. Mr. Hall was called to offer "constructive criticisms" of Senator Cummins' consolidation bill, but his remarks aroused so much incidental discussion among the senators that he had not progressed beyond the first paragraph of the bill when an adjournment was taken. It was expected that Mr. Hall would appear again on February 5.

Mr. Hall said that the prime need of the country is "adequate transportation service but that the foundation on which the bill is based is the declaration in the proposed amendment of paragraph 4 of the present law that the public interest requires that transportation shall be at the lowest rates consistent with a fair return" and that varied conditions "render it impossible to accomplish that end without the further consolidation of carriers and unification of railway properties." He suggested that this be changed to read "the lowest rates consistent with adequate service and a fair return." Senator Cummins said he had assumed that adequate service would be taken for granted but promised to prepare an amendment to be considered by the committee.

Mr. Hall also said that the statement that this cannot

be accomplished without consolidation is not indisputable. "At least we do not know," he said. "We think that consolidations properly guided might tend in that direction but we are not sure that reductions in rates or refraining from increases in rates cannot be accomplished without consolidation. It is at least debatable and I suggest that it is not well to base all this important act on a foundation that is not sure. Consolidations can produce very beneficial results but I should not put as the first of them a reduction of rates, although proper consolidations ought to tend in that direction."

Reduction of rates, he said, is at least not the outstanding feature in a list of reasons for consolidation given by Edward Chambers, vice-president of the Atchison, Topeka & Santa Fe, and former director of the Division of Traffic of the Railroad Administration, whom he referred to as "a very experienced railroad man of good judgment." Among the reasons given by Mr. Chambers were: Ability to give adequate and satisfactory service, direct connections between systems in different territories, access for each system to several ports, maximum distribution of products, minimum number of railroads for products to move over to market, ability to operate solid trains with heavier loading, car supply readily regulated, tonnage requiring special equipment sufficient to justify provision of an adequate supply of such equipment, maximum operation of through trains with a minimum number of junction points and ability to go around congested cities, simplification of handling of rate matters and reduction in number of rate bureaus, simplification of co-operation between Interstate Commerce Commission and carriers, and ability to haul traffic by most direct routes.

"Adequacy and efficiency of service is the great desideratum," said Mr. Hall, "and consolidation should tend in the direction of lower rates, but I am not at all clear that the process of consolidation would result in reductions of rates. Moreover, the country must face the possibility of increases in rates. Rates have not been increased as much as the cost to the carriers of performing the service, and the carriers are for the most part carrying their funded debt at rates of interest fixed when interest was lower than it is now. Perhaps the average rate now is about 4½ per cent. It is to be anticipated that refunding will have to be done at higher rates of interest and it might be necessary to increase the rate of return, now fixed at 5¾ per cent, in order that what is left of the net railway operating income after interest charges are paid shall be sufficient to allow enough for the stockholders to encourage investment in stock issues to provide the new capital that is needed each year."

This led to a digression to explain to Senator Smith of South Carolina that the 5¾ per cent is not figured after the bond interest is paid, as the Senator had supposed, but that bond interest, dividends, if any, and several other items come out of the fair return, if any, after other income, if any, has been added.

Mr. Hall also said that "the immediate need is not affirmative action to establish a limited number of systems, but to remove the existing obstacles that hinder the development of new systems that can compete with existing systems on an equal basis so far as statutory restrictions are concerned."

Wilbur LaRoe, Jr., associate counsel for the Port of New York Authority, asked the committee to remove all doubt in the bill as to the power of the commission to exclude any railway terminal property from a consolidation plan, when it deems it in the public interest to do so to make sure that a jointly used terminal shall not be turned over to a single system. Senator Cummins said he had intended to cover that point by providing in his bill that parts or railways, terminal or line, might be excluded.

International-Great Northern Prospects

*Has had marked increase in net operating income but still
has high operating ratio and heavy debit per diem*

THE International-Great Northern's preliminary report of earnings for 1925 shows a net corporate income after charges and 4 per cent interest on its adjustment mortgage bonds of \$447,489. This compares with \$773,483 in 1924 and with \$430,341 in 1923. No dividends may be paid until after the adjustment bonds have received 6 per cent interest. After allowance for such

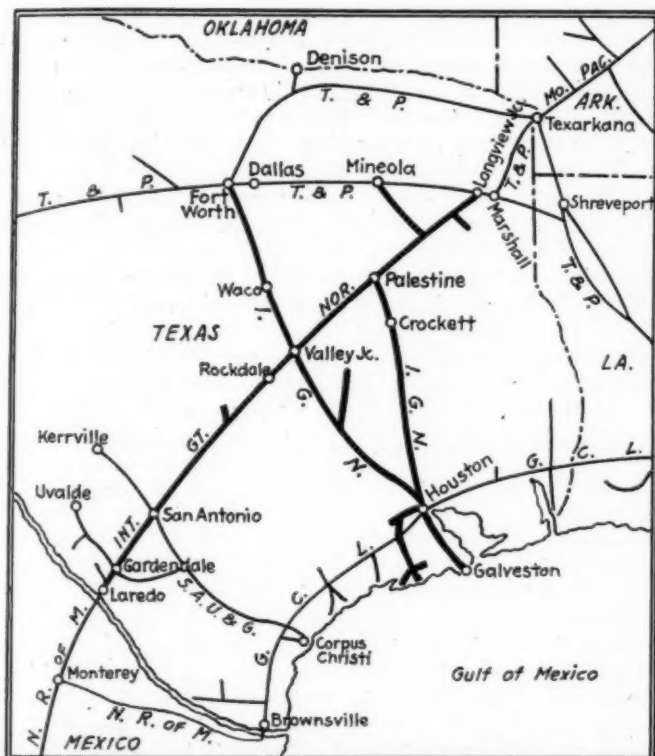
history with the exception only of 1920. The passenger traffic, on the other hand, showed a substantial decrease from 1924 and was, as near as can be judged from the preliminary figures, the lowest in an extended period of years. In spite of the heavy freight traffic, therefore, the total operating revenues in 1925 were only about 1½ per cent greater than in 1924. Operating expenses increased about 3 per cent, due largely, probably, to increased prices for fuel oil.

Net operating income, or net after equipment and joint facility rents, was 13 per cent less in 1925 than in 1924. The 1925 net operating income figure was \$2,239,657; that for 1924, \$2,673,959. However, indication that the property had been making marked progress in recent years is given by comparison with the standard return or net operating income for the three years ended June, 1917, which was \$1,394,946. The 1925 figure exceeded the standard return by over 60 per cent. The roads in the Southwest, after several lean years have more recently had a marked expansion in their earnings, both gross and net. The International-Great Northern was one of the last of the carriers in the district to reflect this new prosperity but it now seems to be on the way to holding its own in comparison with its neighbors.

The International-Great Northern operates 1,160 miles of railroad, all contained within the borders of Texas. It has a line extending from Longview via Austin and San Antonio to Laredo. Another, approximately at right angles to the first, extends from Fort Worth via Waco to Houston, crossing the Longview-Laredo line at Valley Junction. There is also a cross link from Palestine to Houston. The Galveston, Houston & Henderson is controlled jointly with the Katy. The International-Great Northern reaches Galveston by trackage rights over this subsidiary from Houston.

Part of Missouri Pacific System

Since the early part of 1924, the International-Great Northern has formed a part of the restored Missouri Pacific system, it having been acquired at that time through purchase of stock at a price of \$31.00 a share by the New Orleans, Texas & Mexico or Gulf Coast Lines, which become a part of the larger system at about the same time. The International Great Northern has several functions as a part of the Missouri Pacific group. It is an important feeder line. It gives the system its outlet to the Gulf of Mexico at Houston and Galveston. It



The International-Great Northern

6 per cent interest, the net corporate income in 1925 was equivalent to \$1.43 a share on the capital stock and that in 1924 to \$5.78 a share.

In 1925, the International-Great Northern moved about ten per cent more freight ton-miles than in 1924. Complete figures are not yet available, but it would appear that the road's freight traffic in 1925 was the largest in its

TABLE I—INTERNATIONAL-GREAT NORTHERN OPERATING RESULTS, SELECTED ITEMS—1916 TO 1924

Year	Mileage	Revenue ton miles	Revenue passenger miles	Revenue per ton mile cents	Total operating revenues	Total operating expenses	Net operating revenues	Operating Ratio	Net railway operating income	Net after charges	Net charges for additions and betterments
1916	1,160	719,621,000	96,136,000	1.066	10,766,945	7,786,049	2,980,895	72.31	2,070,156	.....	.....
1917	1,160	751,526,000	132,149,000	1.142	12,588,224	8,649,994	3,938,230	68.71	3,255,866	1,331,187	833,805
1918	1,160	691,239,000	141,871,000	1.282	13,476,888	11,643,005	1,833,883	86.39	1,378,645	Def. 364,835	489,215
1919	1,160	718,630,000	126,331,000	1.400	14,410,290	15,189,587	Def. 779,297	105.40	Def. 1,404,787	Def. 339,424	359,560
1920	1,160	922,502,000	135,900,000	1.516	19,514,093	20,038,879	Def. 523,952	102.68	Def. 1,749,257	1,331,187	412,131
1921	1,160	736,286,000	88,099,000	1.787	17,622,393	16,026,423	1,595,970	90.95	Def. 324,441	Def. 1,483,043	728,429
1922	1,160	618,064,000	73,148,000	1.736	14,674,116	12,280,300	2,393,816	83.69	1,318,387	Def. 398,034	.....
1923	1,160	677,806,000	81,282,000	1.713	15,806,608	12,542,633	3,263,975	79.35	2,176,504	*431,511	2,180,185
1924	1,160	721,964,000	76,652,000	1.755	16,901,447	12,955,240	3,946,207	76.65	2,673,959	*773,413	2,908,907
1925	1,159	.....	.....	.....	17,083,748	.....	.....	.....	2,239,657	*447,489	.....

*After interest of \$689,000 or 4 per cent on adjustment mortgage bonds.

furnishes an additional connection between the Gulf Coast Lines and the other Missouri Pacific properties. The line to the Laredo gateway, where connection is made with the National Railways of Mexico, is probably of greater importance from the standpoint of future possibilities than present accomplishments. However, it is estimated that of all the traffic moved by rail to Mexico not less than 72 per cent passes through the Laredo gateway and an additional 6 per cent through the Gulf Coast Lines' connection with the Mexican lines at Brownsville. It should be evident that no system is going to benefit more greatly from Mexican possibilities than the Missouri Pacific. The International-Great Northern connects with the Texas & Pacific at Longview, Mineola and Fort Worth and connects with the Gulf Coast Lines at Houston and with the latter's recent acquisition, the San Antonio, Uvalde & Gulf, at San Antonio and Gardendale. International-Great Northern lines form the southern part of the route of the famous Sunshine Special from St. Louis to Houston and San Antonio.

Cotton Leading Commodity Carried

The most important single commodity carried by the International-Great Northern is cotton. It is grown in every county which the road serves, so perhaps it is not

TABLE II—COMPARISON OF SELECTED FREIGHT OPERATING STATISTICS

	10 Mos. 1925	10 Mos. 1920	Per cent of change	
			Inc.	Dec.
Mileage operated	1,160	1,160	...	...
Gross ton-miles (Thousands).....	2,047,976	2,010,437	1.8	...
Net ton-miles (Thousands).....	792,978	883,510	...	10.2
Freight train-miles (Thousands).....	1,552	2,156	...	28.0
Freight locomotive-miles (Thousands).....	1,569	2,225	...	29.5
Freight car-miles (Thousands).....	57,510	53,842	6.7	...
Freight train-hours (Thousands).....	113,383	178,967	...	36.6
Tons of coal consumed by freight locos..	131,817	193,301	...	32.1
Car-miles per day.....	26.5	31.2	...	15.0
Net tons per loaded car.....	20.7	24.1	...	14.1
Per cent loaded to total car-miles.....	66.7	68.0	...	1.3
Net ton-miles per car-day.....	357	512	...	30.2
Freight cars per train.....	38.0	25.9	41.7	...
Gross tons per train.....	1,319	933	40.4	...
Net tons per train.....	511	410	24.6	...
Train speed, miles per train-hour.....	13.7	12.0	14.1	...
Gross ton-miles per train-hour.....	18,062	11,234	62.6	...
Net ton-miles per train-hour.....	6,994	4,937	41.7	...
Lb. coal per 1,000 gross ton-miles.....	113	...	...	...
Loco. miles per loco. day.....	78.3	93.5	...	16.3
Per cent freight loco. unserviceable.....	17.9	15.4	2.5	...
Per cent freight cars unserviceable.....	12.3	5.1	7.2	...

surprising that the road is one of the largest carriers of cotton in the country. The tonnage of cotton constitutes about 8 to 10 per cent of the road's total revenue tonnage, in addition to which there is a sizable tonnage of cotton seed and its products. Normally, about one-quarter of the road's business is products of agriculture. The road is recognized as having even greater prospects in this respect, particularly because of the possibilities of the opening up of new irrigated areas. An interesting feature of the road's business is its large traffic in onions, some 4,000 carloads of which are received each year about March in the territory just north of Laredo. In 1924, the road's traffic was divided approximately as follows: Products of agriculture, as above noted, about 25 per cent; products of mines, 28 per cent; products of forests, 7 per cent and manufactures and miscellaneous about 26 per cent. Of the last named a considerable proportion—to be exact, 6 per cent of the total tonnage—was refined petroleum. The road does not serve any particularly important oil developments, although it does serve several cities where there are important refineries. It moves a considerable tonnage of lignite which it secures from fields at Crockett, Rockdale and points near San Antonio and Palestine. This is used locally by the cotton gins, for office buildings, etc., and its production varies rather closely with the price of oil. The road originates about

one-half of its traffic and formerly the movement south-bound exceeded that north-bound. It is very likely that the community of interest with the Gulf Coast Lines will bring to the International-Great Northern an increasing proportion of the former's north-bound perishable business moving to such points as Kansas City, Chicago and even New York.

The International-Great Northern's line from Fort Worth to Houston with its 0.7 per cent grades is the lowest grade line between north and south Texas. The road is particularly favored at Houston which seems to be rapidly realizing its ambitions to become an important ocean port. The line of the International-Great Northern parallels the ship canal at Houston and serves a sizable proportion of the industries and warehouses which have been established in the new port. The road has in some years carried into Houston 60 per cent of the cotton carried by all lines.

Lack of Facilities

On the whole, it is not particularly difficult to analyze the reasons why the property was so slow to derive benefit from the increased prosperity of the Southwest in general and Texas in particular. It is apparent that the International-Great Northern's difficulty was its lack of capital and its high cost of operation. It is not difficult to find evidence which bears out these conclusions. Thus, even at the end of 1924, only one-quarter of the road's total mileage was laid with rail of 80 lb. weight or heavier. Most of the heavier rail was 90 lb. and all of that had been laid since the end of 1922. At the end of 1924, also, of the 154 miles between San Antonio and Laredo, 73 miles was still laid with 52 lb. rail and it is only recently that same 75 lb. rail has been put on this district as relay rail released by the 90 lb. rail mentioned above.

At the end of 1924, about 40 per cent of the line had gravel ballast, about 18 per cent shell and about 14 per cent stone; 22 per cent, including notably about two-thirds of the line between San Antonio and Laredo, was still unballasted.

The road as yet has no heavy power. In 1920, the heaviest locomotives were 25 type L Consolidations having a total weight, engine only, of only 102 tons. More recently the road has acquired a number of Mikado type locomotives weighing 137 tons and it ordered in 1925, five Pacific types weighing 145 tons. This situation, combined with the character of the traffic will explain the road's small train load. Another trouble with the property has been its lack of equipment. Thus, it has always had a very high debit per diem balance. This has averaged about three-quarters of a million dollars annually, which is unquestionably a very large amount for a property with only about \$17,000,000 gross revenues. It is of interest that at the end of 1924 it owned 4,283 freight cars, whereas at the end of 1916 it owned 4,915, a reduction of 13 per cent even with the expansion in business which has taken place in the intervening period.

The new Missouri Pacific management did not order any new freight cars for its new subsidiary in 1924 but in 1925 it ordered 1,000 automobile and box cars which with the five Pacific type locomotives referred to above and ten passenger train cars were financed in a recent equipment trust. It is notable in this connection that the trusts sold for the International-Great Northern were sold on the same terms as those for the Missouri Pacific and the Gulf Coast Lines.

Adjustment Bonds

The International-Great Northern was in receivership from August 10, 1914, until November 30, 1922. The reorganization reduced the fixed charges from \$1,597,175

to \$1,179,000 and there was created a \$17,000,000 issue of adjustment mortgage bonds. The interest on these bonds is to be paid, if earned, until January 1, 1928, after which the rate is to be six per cent cumulative. Since January 1, 1923, interest has been paid on these bonds at the rate of four per cent, the interest requirements amounting to \$680,000. Shortly after the acquisition of the International-Great Northern by the Gulf Coast Lines, an offer was made to the holders of the adjustment bonds to guarantee 4 per cent interest to December 31, 1927, provided the bond holders would afford to the new company option to purchase the bonds.

Operating Ratios

It was noted above that the chief trouble with the International-Great Northern in the past has been its high cost of operation and its inability to spend money for those things which would help reduce its costs. The new management has not yet had control of the property a sufficient length of time to demonstrate what it is going to be able to do. A picture of the adverse conditions in which the road operated a few years back is indicated by the fact that in the year ending June 30, 1916, the road had an operating ratio of 78 per cent and a ratio of transportation expenses to total operating revenues of 40 per cent. In 1924, its operating ratio was 76.65 and its transportation ratio was 36.16. This is some improvement although not as much as the property will have to show if it is to be really prosperous. It happens that a handy comparison is offered in this instance with the Gulf Coast Lines which in 1924 had an operating ratio of only 62.07 and a transportation ratio of only 25.18. The International-Great Northern did not quite hold its own in 1925 because in that year its operating ratio again went up to 79.0 and its transportation ratio to 39.0.

Improvement Indicated by Operating Statistics

An interesting part of the picture is contained in a comparison of some of the operating statistics. Figures are now available for the first ten months of 1925 and in table II these are compared with the first ten months of 1920, that year being taken because it was one of the busiest in the company's history and because it is a sufficient number of years back to give a better comparison of the trends. One notices first in the comparison given in the table the decrease in the ten months period of 1925 compared with the same period of 1920 of 10.2 per cent in the net ton-miles. To handle this traffic, however, the road required 28.0 per cent less freight-train miles, 29.5 per cent less freight locomotive-miles, 32.1 per cent less fuel and most important of all, a decrease of not less than 36.6 in freight-train hours. The road's traffic is such that it is unable to get a heavy car-load and in fact in 1925 it had a substantial decrease from its car-load in 1920. There was also a decrease in its car-miles per day and its net ton-miles per car-day. To handle the 10.2 per cent less ton-miles there were required 6.7 per cent more freight car miles.

Such improvement as there has been seems to have come principally with reference to the train loading rather than the car loading. Thus, one notices particularly the 41.7 per cent increase in the freight cars per train and the increase of 40.4 in the gross tons per train and the 24.6 per cent increase in the net tons per train, as also the substantial increase in train speed. Unquestionably, the most striking feature in the entire table is the increase from 11,234 gross ton-miles per train-hour in the first ten months in 1920 to 18,062 in the first ten months of 1925, a remarkable increase of 62.6 per cent. It compares with an increase for the southwestern roads as a whole of 31 per cent.

This brief analysis would seem to indicate that the International-Great Northern has had in recent years a remarkable improvement in efficiency and earnings. It would also seem to show, however, that it still has a long way to go before it can be said to be operated with the efficiency and earning power that we are coming to expect of the roads operated by the new Missouri Pacific management.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the first four weeks of this year has fallen slightly below the record figures for the corresponding period of last year. For the week ended January 23 the total was 921,734 cars, a decrease of 2,557 cars as compared with 1925, although an increase of 30,253 cars as compared with 1924.

The coke, merchandise and miscellaneous freight showed increases as compared with last year, but the other commodity classifications showed reductions, as did all districts except the Allegheny, Pocahontas and Southern. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Districts	1926	1925	1924
Eastern	209,708	210,261	212,614
Allegheny	185,912	185,024	179,866
Pocahontas	54,786	49,888	39,925
Southern	146,565	139,061	139,071
Northwestern	113,691	123,302	113,825
Central Western	146,017	151,157	144,751
Southwestern	65,055	65,598	61,369
Total Western	324,763	340,057	319,945
Commodities			
Grain and grain products	45,699	53,758	48,690
Live stock	30,740	33,000	35,699
Coal	180,923	202,184	204,396
Coke	18,374	13,881	12,467
Forest products	69,330	73,219	73,055
Ore	10,058	10,236	2,530
Mdse. L. C. L.	246,597	239,217	225,648
Miscellaneous	319,423	299,296	282,996
Total	921,734	924,291	891,481
January 16	936,655	934,022	894,851
January 9	907,119	934,170	872,023
January 2	741,239	767,098	706,292
December 26		701,079	647,324
Cumulative total, 4 weeks	3,506,747	3,559,581	3,364,647

The freight car surplus for the period January 15 to 22 averaged 264,781 cars, including 126,768 box cars and 96,255 coal cars. The Canadian roads for the same week had a surplus of 25,040 cars, including 20,375 box cars and 300 coal cars.

Car Loading in Canada

Revenue car loadings at stations in Canada in the week ended January 23 were lighter than the previous week by 2,602 cars. Grain loading was lighter by 1,624 cars, embargoes at certain points in Western Canada being responsible. Compared with the same week last year the loadings were heavier by 3,864 cars.

Commodities	Total for Canada			Cumulative Totals to Date	
	Jan. 23, 1926	Jan. 16, 1926	Jan. 24, 1925	1926	1925
Grain and grain products	7,651	9,275	6,753	27,787	19,171
Live stock	2,252	2,143	2,309	6,872	7,915
Coal	5,024	5,929	3,971	17,116	18,087
Coke	383	390	334	1,287	966
Lumber	3,074	2,900	2,692	8,233	7,882
Pulp wood	3,985	4,037	4,169	11,098	11,563
Pulp and paper	2,629	2,702	2,157	7,902	6,119
Other forest products	3,244	3,449	3,324	9,093	8,390
Ore	1,448	1,468	1,299	4,242	3,539
Merchandise, L. C. L.	14,307	14,079	13,906	42,031	39,991
Miscellaneous	10,194	10,421	9,413	29,882	29,070
Total cars loaded	54,191	56,793	50,327	165,543	152,693
Total cars received from connections	36,160	33,544	34,603	99,273	97,985

Vauclain Discusses Outlook for Diesel Locomotive*

*Probability of extensive displacement of steam power remote
—Electric transmission most promising*

By Samuel M. Vauclain

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THE steam locomotive has dominated transportation since its successful introduction approximately 100 years ago. It has steadily improved. Its performance, through greatly increased tractive force, has met the needs of modern transportation arising from the tremendous development of the world in the past 50 years. As a single self-contained power unit it is without equal so far as its general efficiency and low cost of production are concerned. Therefore, when discussing railway motive power, the standard of comparison must be the steam locomotive, which occupies a strongly entrenched position from both practical and sentimental viewpoints.

With the established efficiency of modern internal combustion engines before him, the designer of railway motive power is naturally attracted toward their possibilities of employment within his special field of endeavor. The Diesel motor shows an overall thermal efficiency as high as 33 per cent, while the best steam locomotive performance is about one-quarter of this figure. But even with this handicap, the steam locomotive of today is a remarkably flexible and reliable traveling power plant. In order to compete properly, no matter what the fuel economies may be, the internal combustion locomotive must approximate this same flexibility and reliability. It must have ease of control, ability to start a full tonnage train, and adaptability to the rapid change in physical conditions met in operation, such as variable speeds, gradients, curves and weather conditions. It must not be too complicated in detail nor too heavy per horsepower developed. Herein, then, are the basic features which the designer must constantly bear in mind. While a gain in thermal efficiency will warrant an increase in initial cost, the price must not be so prohibitive as to offset the anticipated gain in cost of operation.

European experience in Diesel locomotive construction has been more extensive than that of the United States and some late opinions on comparative costs are interesting. J. W. Hobson, of R. & W. Hawthorne, Leslie and Company, in an engineering discussion of 1925, states that in England the cost of Diesel locomotives with hydraulic transmission averages about 1.48 times the cost of a steam locomotive of equal capacity, complete with tender; and that the same measure of comparison for a Diesel-electric locomotive yields a ratio of 1.9. Dr. Herbert Brown, of the Swiss Locomotive and Machine Works, Winterthur, Switzerland, states that continental figures on the same basis yield an average cost for the Diesel-electric locomotive equal to 1.783 times the cost of the steam unit.

The problem naturally divides itself into the development of two general classes of power; self-propelled vehicles for light traffic, and locomotive units for hauling trains equal in tonnage to those hauled by steam locomotives. The first division offers easier accomplishment be-

cause the power required is low and the weight of engine and transmission details, compared with the entire weight of the vehicle, will make possible an economical unit; one which can be kept well within the restrictions of axle loadings, while allowing a high weight per horsepower developed. As the average full powered steam locomotive can be built within a weight of 140 lb. per horsepower, it should be quite easy to produce a low powered vehicle weighing, say 90,000 lb. (the weight of a modern steel day-coach) and operate it by power units producing 200 hp.; an arrangement giving 1 hp. to every 450 lb. Such a vehicle, even if the weight is increased by its machinery to 100,000 lb., can be operated economically up to its capacity, serve the needs of a light, or branch line traffic, and still not exceed an axle loading of 30,000 lb on its principal driving axle.

Weight Per Horsepower a Vital Factor

In applying the Diesel heavy-oil engine to true locomotive units, the first consideration must be of the weight per horsepower developed. The heavier classes of Diesel engines in stationary service weigh within a range of 170 lb. to 350 lb. per horsepower. In locomotive service the weight of the Diesel engine must be added to the weight of transmission, running gear and vehicle body. If a 1,000-hp. Diesel engine of 170 lb. per horsepower is used in a locomotive, its weight of 170,000 lb. would exceed the total weight of a complete steam locomotive of like capacity. During the great war some Diesel engines for submarine service were built showing a horsepower for every 65 lb. of engine weight. The locomotive designer needs this type of machine. The 1,000-hp. Diesel-electric locomotive built in Germany for the Russian Railways (1924) has a total weight of 275,000 lb.; 275 lb. per horsepower.

The 1,000-hp. rated Diesel-electric locomotive built in 1925 by the Baldwin Locomotive Works also weighs 275 lb. per hp. This indicates a close coincidence of the best European and American practice and sets for the present this weight per hp. for modern Diesel-electric locomotives. A slight decrease in weight can be looked for with an advance in locomotive horsepower, and the present expectation in this respect is about 220 lb., which represents a ratio of about 1 to 1.5 when compared with an average steam locomotive. With a thermal efficiency of 3 to 1 in favor of the Diesel engine, it appears that the added weight per hp. is not a severe handicap. Ratios of this character, provided they go hand in hand with simplicity, should show attractive operating economies. What, then, should be the features tending toward simplicity of maintenance?

Inasmuch as the Diesel, or other internal combustion engine must be operated at speeds within its range of efficiency, and not a practically zero start, as in direct connection; the designer must find proper means for connecting the running prime mover to the locomotive driving

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mechanism. This transfer of power can be accomplished in three ways: By mechanical, stepped-gearing transmissions; by hydraulic, fluid-pressure transmissions; and transmission of power by electricity. Each of these systems will be separately described and examples given of locomotives so equipped.

Mechanical Transmissions—These are of the ordinary change-speed stepped-gearing variety as applied in automobile practice; although in locomotive construction they should preferably be arranged to give the same range of speeds both forward and backward. Reversing is usually accomplished by bevel gearing. Mechanical transmission require some sort of a friction clutch and this feature gives trouble on the upper range of power to which mechanical transmission is applicable. It is probable that 150 hp. is the practical limit for mechanical transmission.

Hydraulic Transmission—This form of transmission usually employs oil as a power transference medium, and is attractive because of the possibility of infinite speed variations; some designs, however, fail to secure this possibility. Hydraulic transmission is suitable for locomotives of comparatively high power and shows less initial cost than electric transmissions of equal capacity. It has, however, the disadvantage of concentrating its final driving power into one gear wheel, which makes it dependent on tooth contact and pressure. Its limitation is probably in the neighborhood of 500 hp., although its advocates claim adaptability to twice this figure. All designs employ a primary unit, or pump, which supplies oil under pressure to a secondary unit, or rotor. If the stroke of the pistons in the primary unit permit variation from zero to maximum, it follows that variability of speed can be obtained in the secondary unit, which is practically of reverse operation to the primary one. The Hele-Shaw and Lentz transmissions are the best known examples of the hydraulic transmission.

The Lentz system, which is usually considered the most successful hydraulic transmission, does not give infinitely variable speeds, but because of its simpler construction and the lower oil pressures employed, avoids the operating mishaps of more complicated systems. It gives a definite number of primary speeds, and intermediate speeds are obtained by the by-passing of the transmission oil, or by varying the speed of the main motor. As the oil pressures in the Lentz gear do not exceed 500 lb. per sq. in. at starting and averages 50 to 150 lb. when operating at speed, leakage is not so serious a matter as with the other types of hydraulic transmissions. Numerous European locomotives have been fitted with the Lentz gear, including four 400-hp. engines manufactured by the Linke-Hofmann Company for the German State Railways. A 60-hp. Lentz engine tested in 1924 on the London and North-Eastern is reported to have given highly satisfactory results within its power limitations.

The Schneider system is really a combination of mechanical and hydraulic transmission, the increased torque required at low speeds being obtained from the relative motion between the rotor and its casing. The energy due to slippage augments the power by an additional torque on the secondary unit. By this arrangement the usual power losses in hydraulic transfer are decreased and the general efficiency of the transmission is improved, especially at the higher operating speeds.

Electric Transmission—In this system the prime mover is connected to an electric generator which furnishes current to operate suitably disposed driving motors. Electric transmission gives a continually variable gear, allowing the locomotive to adapt itself advantageously to the speed of the prime mover. It makes driving easy and is readily adaptable to double-end control. The installation is expensive, but from the railway operating viewpoint, is the

most attractive transmission. Within recent years quite a few Diesel-electric locomotives have been built in Europe and the United States.

Diesel-Electric and Steam Locomotives Compared

The Diesel-electric locomotive that has attracted most attention in Europe is the design by Professor Lomonosoff, constructed at Dusseldorf, Germany, for the Russian Government Railways. This machine is a unit in the elaborate program of comparison planned by the Soviet authorities. It is of 2-10-2 wheel arrangement, with five motor-driven axles. It is arranged for double-end control, the drivers' cabins being located over the carrying trucks. The engine is a Diesel submarine type, four-cycle, six-cylinder unit, with compressed air fuel injector. Its normal speed is 450 r.p.m.; its maximum power, 1,200 hp. The locomotive unit itself is rated at 1,000 hp., and to verify this rating the machine was thoroughly tested on a special plant, similar to that of the Pennsylvania at Altoona. The generator is of 800 kw. capacity at 600 to 1,100 volts and is directly coupled to the prime mover by a flexible coupling. The exciter, carried on the end of the generator shaft, is itself excited by an auxiliary dynamo operated by a storage battery. A peculiarity of the locomotive is its cooling system, located at one extremity of the structure. The water flows through a piping system cooled by a fan-forced circulation of air; this is quite ordinary and is reported to be sufficient for the cooling requirements during winter and ordinary temperatures. Summer operation in such temperatures as are common in Russian Turkestan, 120 deg. F., will so overload the engine cooling system that a cooling tender must be used which carries extra radiating equipment with fans driven by an auxiliary Diesel engine.

The engine weighs 340 lb. per horsepower. This feature is certainly not in line with the all around utility ideas common with railway men in the United States. The Lomonosoff locomotive was assembled at the Hohenzollern Locomotive Works in Dusseldorf, where tests were made on the roller plant. A comparison was made of these with tests of a Russian type 0-10-0 steam locomotive, oil fired. Dr. Herbert Brown of Winterthur, who personally assisted in these tests, reports an average overall thermal efficiency of 7.43 per cent for the steam locomotive and 26.4 per cent for the Diesel-electric, showing the latter to have been over $3\frac{1}{2}$ times as efficient as the steam locomotive; very significant figures when first cost and maintenance charges are to be considered. Dr. Brown also gives information on the weight of component details entering into the Diesel locomotive ensemble. He estimates that the prime mover, including its auxiliaries, takes about 44 per cent, the total weight of the electrical equipment 30.5 per cent, leaving for the mechanical structure and running gear only 25.5 per cent.

Recent internal combustion locomotive construction in the United States has been only along the lines of electric transmission. The General Electric Company built in 1924 a gas-electric engine of 175 hp. for use around the Pittsfield Works. In 1925, a 300-hp. Diesel-electric engine, weighing 60 tons (400 lb. per hp.) was built jointly by the General Electric Company, The American Locomotive Company and the Ingersoll-Rand Company, the last mentioned company manufacturing the Diesel motor used as the prime mover. After tests in the builders' yards, it was experimentally exploited on several of the railways in the vicinity of New York City. The same combination of manufacturers has since built for the Long Island Railroad a similar machine of twice the power. Comparison of this machine will shortly be made with a gas-electric locomotive built by the J. G. Brill Company

for the same railroad. This engine weighs 75 tons (300 lb. per hp.) and is equipped with twin power plants, each consisting of a 250-hp. gasoline engine coupled to a generator of 160 kw. capacity. The comparison of heavy oil and gasoline motors in the same class of service and on the same railroad will furnish very interesting data.

In 1925 the Baldwin Locomotive Works produced a Diesel-electric locomotive of 1,000 hp., the prime mover for which is a two-cycle solid injection engine of peculiar construction and very light weight. This machine represents the largest unit ever attempted in the United States. It is the result of extensive research and experimentation to fulfill the requirements of a reliable self-contained unit, of simplest possible ensemble and ease of control. This locomotive weighs 275,000 lb. (275 lb. per hp.) and is mounted on two six-wheeled trucks having traction motors applied to four of the six axles. Its electrical equipment is of Westinghouse manufacture, with electro-pneumatic and magnetic controlling mechanism arranged for double-end operation. The Diesel engine is of the inverted "V" type with twin crank shafts geared to a central shaft on which is mounted the electrical generator. This locomotive is now undergoing intensive tests at the yards of its builders and on adjacent railway lines.

Much Further Development Work Essential

It is my opinion that considerable time must elapse and many millions of dollars be expended in the development of an oil-electric power unit in the shape of a locomotive before machines of this type will figure to any great extent in transportation service. It has many apparent advantages that are not only of great interest to railway men, but which are very seductive to those who do not clearly understand all that is involved. You will have noted that at the present time construction costs are as 2 to 1 compared to steam power. We have all the same thought: if a Diesel engine-driven locomotive as serviceable as the present steam locomotive and as economically maintained in service can be produced, great relief and resultant economy will be obtained by the elimination of ash pits and the various ash-handling devices connected therewith, by the avoidance of the necessity for transferring refuse and the periodical attention required to keep the ordinary steam locomotive in proper condition for service, not to mention the satisfaction that the elimination of boiler explosions, etc., will bring to those men responsible for railroad motive power. It must not be forgotten that these anxieties have been almost entirely removed by proper regulation of the maintenance and use of steam locomotives and the only accidents now being recorded are those due to the personal equation, and which, therefore, can never be entirely overcome.

The internal combustion locomotive unit, whether constructed with direct drive, hydraulic transmission, or electric transmission, is yet in its infancy. The best engineering talent of the world is bending its energy to a successful solution of the problem and we will not know what new difficulties in operation will be encountered or what the anxieties of the future may be in the matter of safety until the actual operation of some appreciable number of engines gives us a thorough experience. The introduction of electric power for transportation purposes has been slow. The expense of installation and the general inconvenience and obstruction incident to its application in service yards and large railway terminals have militated against it; but step by step it has progressed and become a necessity for all underground transportation, or for increasing the volume of traffic handled over such sections of railway as are difficult of operation and on which the use of steam locomotives has reached its limit.

If it will be possible for those of us engaged in the

development of internal combustion locomotives to produce a satisfactory machine at a satisfactory price to the purchaser, its greatest effect upon the transportation methods of the country will be to further the electrification of railways in general. This experiment is now being tried in Switzerland, as I have previously stated, and if by the use of internal combustion locomotives all branch line service as well as all distributing service at railway terminals, both large and small, can be satisfactorily accomplished, and only main line service by overhead wires or third rails be required, we can then expect a more rapid development in the electrification of our railways. But it will be many years before the steam locomotive, owing to its simplicity, its serviceability and its low production cost will be relegated to the era of the past.

Hearings on Railway Labor Bill

WASHINGTON, D. C.

HEARINGS on the Watson-Parker railway labor bill have been continued before both the Senate committee on interstate commerce and the House committee on interstate and foreign commerce. Although the testimony before the latter committee has been much the same as that previously given before the Senate committee the spokesmen for the railroads and the labor organizations have been able to anticipate to some extent the questions which arose in the other committee and have also included their replies to the objections voiced by J. A. Emery, general counsel for the National Association of Manufacturers. Also the much larger attendance of members of the House committee than of the Senate committee has led to many questions being asked.

Daniel Willard, president of the Baltimore & Ohio, and P. E. Crowley, president of the New York Central, both of whom participated in the negotiations with the labor committee that led to the agreement on the terms of the bill, testified before the Senate committee on February 1, stating that while they did not regard the bill as perfect they felt that the plan proposed would go farther toward the adjustment of railway labor controversies than anything that has yet been tried and asking that Congress afford an opportunity to try it by passing the bill. Mr. Willard said that, starting off with the confidence of a large part of the representatives of both sides, the plan will have a better chance of success than some other that might be more satisfactory to one side. While he would not contend that the bill is perfect, he said it represents a sincere effort on the part of both sides to reach a common understanding for the purpose of attempting at least to prevent an interruption of transportation. While no one can claim that it would prevent the possibility of a strike, he said he knew of no legislation that could be said to afford a guaranty against strikes and he believed that this plan of dealing with such questions is as likely to prevent strikes as any bill that could be drawn at this time and more likely than the provisions of the present law.

In reply to Senator Couzens' suggestion that the agreement was reached without any participation on the part of the public interest, Mr. Willard said that those who did participate were not wholly forgetful of the public interest, although the public had not said much to indicate its position as to the Howell-Barkley bill. He had hoped the Railway Labor Board would work better than it has, but it had "seemed to get off on the wrong foot." If it had had time to establish confidence in itself before being called upon to decide such great questions as were put before it at the start, it might have done better, but it

seems to have lost the confidence of the labor organizations and many of the railway executives as well as of many who might be considered as representatives of the public, and it therefore seemed better to try to find some substitute. As far as rates are concerned, he said, the public would still have the same protection as it always has had in the Interstate Commerce Commission and he thought that, looking back, no one could now say that the railroads have paid excessive wages while the rates are still the lowest in the world.

Senator Bruce, of Maryland, who has been criticising the bill since the hearings started because it provides for the selection of partisan arbitrators and because the emergency commission is not given power to compel testimony, said that in its present shape the bill is entirely unsatisfactory to him and that he intended to oppose it. Senator Couzens also said that there is a great deal of opposition to the bill on the ground that it represents an agreement of two powerful interests in which the public was not represented.

Mr. Willard said he thought that the railway record as to strikes has been rather creditable and that under the Newlands law the mediators were able to settle the majority of disputes, although there was one notable case in which the law failed and Congress stepped in and settled it by passing the Adamson law. He said he thought the strong part of the bill is the provisions regarding the Board of Mediation, which is given greater opportunity than ever before to bring about a settlement. He also pointed out that the emergency commission would have access to most of the information it would need as a matter of public record from the files of the Interstate Commerce Commission, the Bureau of Labor Statistics, and the earlier wage boards, and that the real decision of a board of arbitration would naturally rest with the neutral arbitrators, selected by agreement of the partisan members or by the Board of Mediation.

"This isn't exactly the kind of bill either of us would have preferred," he said in conclusion, "and I would rather not suggest the amendments I might be inclined to suggest and probably have urged in conference, but it is a good bill and I hope Congress will pass it."

Mr. Crowley also expressed the hope that Congress would give the bill favorable consideration, because it contains the very important fundamental idea that railways and employees shall settle their controversies at home, and in a large measure it is an assurance to the public that they will not have strikes. He said he could not imagine the representatives of either side denying to the representatives of the President any information they would desire and that the provision of a "cooling-off period" of 30 days for the appointment of the emergency commission and 30 days thereafter for a report represented an all-important concession on the part of the labor organizations to what the executives wanted.

The National Association of Manufacturers furnished to the press for release on February 1 a printed statement in the form of a news dispatch from Washington, headed: "Washington Startled by Rail Employees' Demand for Huge Wage Increases While Talking Peace. Passage of Watson-Parker Bill Would Throw Country Back Into the Situation Faced by President Wilson When the Employees Forced the Adamson Law Under Threat of a Nation-wide Strike." It referred to the "revelation" that railroad employees will make a new demand for wage increases amounting to \$500,000,000 a year as a "stunning blow" on the heels of the bill, and quoted J. F. Callbreath, secretary of the American Mining Congress; W. B. Barr, Washington representative of the Grain Dealers' National Association, and Frank F. Porter, vice-chairman of the National Industrial Council, as criticising the bill, in addition

to John E. Edgerton, president of the National Association of Manufacturers.

At the hearing before the House committee on February 2 Donald R. Richberg, counsel for the railway labor organizations, referred to this statement as completely misrepresenting the position of the organizations and as a "deliberate effort being made to create a false impression by propaganda." He said that newspapers are being given the impression that there is a "general concerted wage movement" and he denied that there is any such movement, although he said that certain negotiations are pending between certain organizations and the railroads. D. B. Robertson, president of the Brotherhood of Locomotive Firemen and Enginemen, said: "There is absolutely no connection between any desire on the part of the men for increases in wages and their desire for this legislation; they are two separate things," although he added that the machinery set up in the bill "would doubtless be employed unless there was an agreement between the railroads and their employees." He said that a referendum of the individual members of his organization is being taken as to whether it shall make a concerted demand upon the roads, that it has been going on since last May and is to be completed some time this month. He said he understood also that the trainmen and conductors have asked for an increase, but that the engineers have not. Both he and Mr. Richberg ridiculed the estimate of \$500,000,000 as exaggerated and without foundation, but when asked how much the increase being voted on by the firemen would aggregate he said they are voting on an increase of about 18 per cent, but that it would be impossible to say what the amount would be until the vote was in to show how many roads would be included.

Representative Rayburn of Texas read a letter he had received from C. E. Schaff, president of the Missouri-Kansas-Texas, saying that there is a popular misunderstanding of the attitude of the railroads toward the proposed legislation. He said there had been no expression of preference on the part of the railway executives generally in favor of the bill as against the provisions of the present law and that the southwestern roads and some others are against it; that it is more than probable that an expression could be obtained from the railway executives preferring the present law to the new plan, but that if there is to be a substitute for the Railroad Labor Board the provisions of the bill would perhaps be acceptable.

Alfred P. Thom, general counsel of the Association of Railway Executives, reminded the committee that he had told them that 20 railway executives had voted against the resolution approving the bill in principle at the Chicago meeting, to 52 who had voted for it, and that the vote had been taken after he had given an opinion that Congress was very likely to abolish the Labor Board. He said that there are pending proposals for increased wages on the part of certain organizations, and if the bill is not passed they will not submit the question to the Labor Board, whereas their officers have told Congress that if this bill is passed it will prevent an interruption of transportation. In reply to questions by several members of the committee as to whether the public is not "losing a little ground in the bill" as compared with the provisions of the present law, and as to whether there is not danger that the railroads will agree too readily to grant wage increases, expecting the public to pay for them in increased rates, Mr. Thom said that in view of the uncertainty that attends an application to the commission for a rate increase and the extent to which the professional reputation of a railway executive depends upon the success of his operation, the idea is "perfectly untenable" that he will agree to an unreasonable wage increase.

Representative Barkley asked Mr. Thom if, as a lawyer,

he believed that Congress could take away the right of agreement between railroads and their employees. Mr. Thom said he had no desire to discuss the matter and that Mr. Richberg had different views, but, when pressed, he said he thought Congress has the right to regulate the instrumentalities of interstate commerce and say that a certain standard of expense shall not be exceeded. He believed that it will ultimately be determined by the courts that Congress has the right, in regulating commerce, to see that expenditures for labor are adequate and also that they are not so excessive as to be a burden on transportation, but that it would not be wise to exercise such power at this time or until there should be some demonstration that the public interest required it.

J. G. Walber, vice-president of the New York Central, outlined some of the conditions under which the negotiations which resulted in the draft of the bill were conducted. He and Elisha Lee, vice-president of the Pennsylvania, were selected to conduct the direct negotiations for the railways, and they had received no other instructions except: "You are familiar with the dissatisfaction with the present law; the expressions of the President about it, etc.; see what you can work out and bring your report back to this joint conference." It was their purpose, he said, to devise provisions which would apply alike to all employees and to give employees full freedom in the making of agreements affecting their welfare, and they believe that it is more to the interest of all concerned to have the situation left where the parties are free to act voluntarily than would result if any compulsion were to be introduced into the law.

"We know," he said, "that in recent years there has been a very definite change in the relations between managing officers and employees. We know that no managing officers can afford to fail to encourage that spirit of co-operation between themselves and the employees which exists to a greater extent than many people realize. We believe that more can be gained by both interests by their working together than by pulling in opposite directions. This conviction is entirely aside from the sympathy we have for the interests of the employees. We approached this present task with the underlying motive that here is an opportunity for us to work out a plan by which we can work together."

In the provisions which they urged for the emergency commission Mr. Walber said, they provided for powers of investigation similar to those to be given arbitrators, and also that the board should have 60 days for making its investigation and report, and after two separate conferences of the joint conference committee of executives and labor representatives compromises were made which resulted in an agreement which was later drafted into the form of a bill.

Mr. Walber said he did not believe a national labor board would have been created if it had not been for the conditions produced by the taking over of the railroads by the government during the war, and that one of the outstanding reasons for the dissatisfaction with decisions of the Labor Board is that the country is so great in size and its conditions and problems so diversified that it is virtually impossible for any one tribunal to take them into consideration. He pointed out that in the case of the last demand of the engineers and firemen on the western roads the board had rendered an actual decision but the organizations refused to accept it and settlements were eventually made by individual roads. In the face of such recent experiences it was felt to be in the interest of the roads and of the public to endeavor to devise machinery which would be acceptable to the parties directly affected and also to the public. He did not believe an instance could be found wherein the Labor Board had suspended an

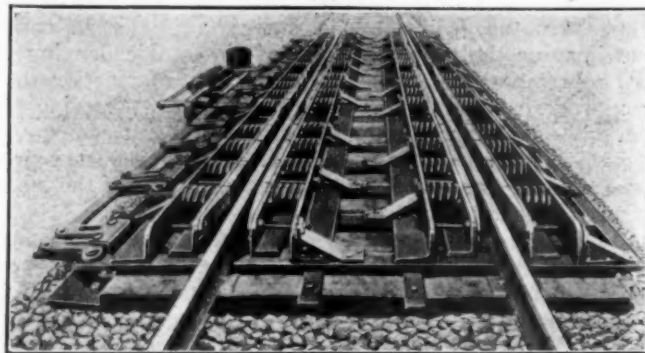
agreement and said that the assumed protection of the public against any agreements that might be made between managements and employees is purely academic.

Replying to questions, Mr. Walber said he thought the effect of the new plan would be to settle many disputes "at home" such as has been referred to the Labor Board and that of the 500 or 600 cases now pending before the board which would be left to go back to the parties for settlement, many would be dropped altogether. He had not interpreted the statements of President Coolidge as indicating his opinion that the Labor Board should be abolished, but rather as cautious statements that if an acceptable substitute could be found it might well be had. When asked regarding the extent to which the Interstate Commerce Commission might have to give recognition to wage increases in fixing rates, Mr. Walber said he assumed the commission would accept the wage bill as a fact to be considered unless it were challenged but that he would never forget the grilling he had received when a witness before the commission in a rate case in explaining the facts regarding a wage increase made by a board of arbitration, and that the commission certainly has power to prevent a rate increase which it regards as unreasonable.

Ben C. Cain, vice-president of the American Short Line Railroad Association, gave a statement similar to that made by President Bird M. Robinson of the association before the Senate committee to the effect that the short lines do not oppose the bill because of their understanding that it would not affect settlements they might make with their own employees. Statements were also presented by a number of the railway labor leaders similar to those presented before the Senate committee and Mr. Emery was to make his statement in criticism of features of the bill on February 4.

The Union Electro-Pneumatic Car Retarder System

AN electro-pneumatic car retarder system has been placed on the market by the Union Switch & Signal Company, and is now being installed on a new 69-track unit of the Markham gravity classification yard of the Illinois Central at Harvey, Ill., near Chicago.

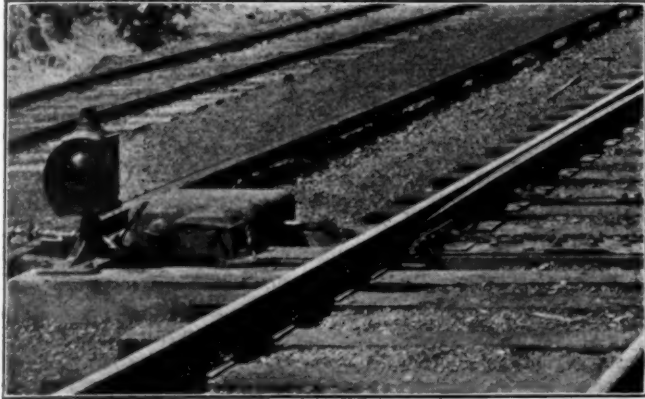


Union Electro-Pneumatic Mechanism Adapted to Operate Car Retarder Arrangement

The car retarder system as invented and developed by officers of the Indiana Harbor Belt at the Gibson, Ind., yard was described in the *Railway Age* of November 15, 1924, and May 9, 1925. Since that time the Union Switch & Signal Company, together with its associate, the Westinghouse Air Brake Company, has, by an agreement with the inventors, continued the development of the electro-

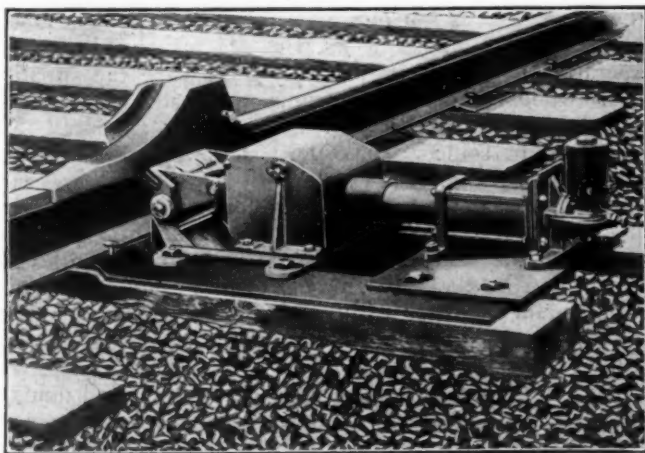
pneumatic car retarder system and in doing so has incorporated many of the control features of its electro-pneumatic interlocking.

After making a series of tests to determine the operating characteristics of the car retarder arrangements, the Union Company adapted its standard electro-pneumatic switch machine for the operation of the car retarder. The brake shoes of the car retarder are forced against the



Electro-Pneumatic Special Direct Acting Switch Throwing Mechanism

inside and outside faces of the car wheels by compressed air acting on a piston, which, through levers, transmits the force to the brake shoes. The application and release of this air, and thereby the operation of the retarder, are controlled electrically by means of three control valves, each including a magnet with an air valve. These electro-magnetic air valves are of a design similar to those used extensively on the Union system of electro-pneumatic interlocking. One valve controls the admission of



Skate Mechanism Showing Skate in Place on the Rail

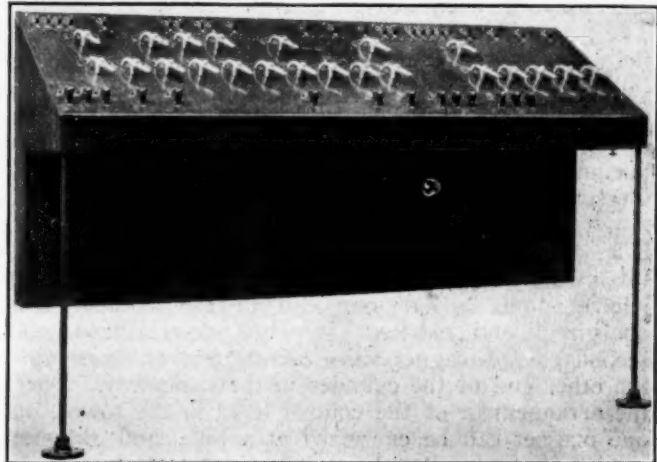
air, one the exhaust and one the release. A pressure controller is provided, by means of which the results described below are obtained.

This control apparatus is so constructed that various pressures may be applied to the operating cylinder, thus varying the pressure exerted by the retarder, so that by using these different pressures, the cars of different weights and running at different speeds are controlled as desired.

The moving of the control lever to any one of the various contacts corresponding to the pressure desired, completes the control circuit, thus energizing the control magnet which results in the admission of air to the operating

cylinder, forcing its piston out and the retarder shoes are then in position to exert pressure against the car wheels. The pressure in the operating cylinder builds up almost instantaneously until it reaches the pressure corresponding to the contact made by the control lever and at this point the pressure controller contact opens and no more air is admitted to the operating cylinder.

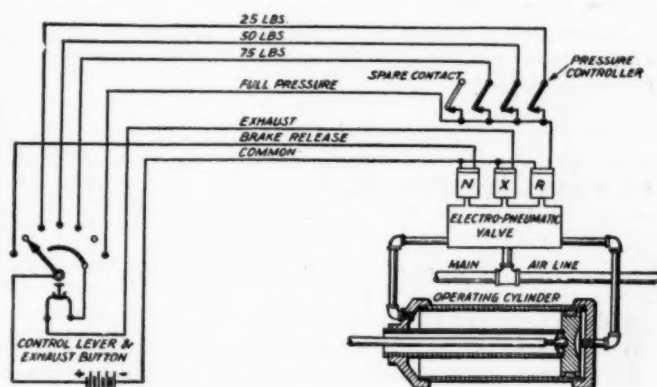
If the operator finds that he is not using sufficient pressure he moves the control lever to the contact corresponding to the higher pressure, when the above operation is immediately repeated, except that the pressure builds up from the pressure formerly obtained, instead of from zero. This "no loss" of pressure is assured by the



Each Tower Contains a Control Board for the Control of Switches, Retarders and Skates

exhaust magnet always being energized when the control lever is in position to establish pressure in the operating cylinder.

If the operator finds that he is using too much pressure he has two courses open. He can release the apparatus entirely by moving the control lever to establish contact with the brake release, in which case the exhaust magnet is de-energized, exhausting the air from the operating



Control Circuit for Operation of Electro-Pneumatic Car Retarder System

side of the piston. At the same time the release magnet is energized, admitting the air to the release side of the piston and forcing it back. If he does not desire to release the apparatus entirely, he can push the exhaust button in the control lever, which thus de-energizes the exhaust magnet and exhausts the air from the operating side of the piston, but only for as long a period as he holds the exhaust button open. When he releases the exhaust but-

tion, the air immediately builds up again in the operating cylinder to the pressure corresponding to the contact made by the control lever. The advantages of the quick release obtained by releasing pneumatically instead of using a spring, as in the car brake cylinder, are obvious.

The skate mechanism, as manufactured by the Union Company, is simply a small pneumatic cylinder, the piston rod of which is connected to a series of levers, so that when the piston rod is forced out the skate is placed on the rail, and when forced back the skate is removed from the rail, provided a car has not passed in the meantime. An electro-magnet controls the admission of air to this cylinder; when energized, air is admitted to the cylinder, and when de-energized it is exhausted to atmosphere. The forcing back of the piston is caused by a spring and the weight of the skate itself.

The direct acting electro-pneumatic switch mechanism being furnished by the Union Company for the operation of switches in classification yards consists of a small pneumatic cylinder, the piston rod of which is connected directly to the throw rod of the switch; when the piston is out the switch is in one position, and when the piston is in, the switch is in the other position. The air for this cylinder is controlled by two electro-magnets, one of which admits air to one end of the cylinder when energized, and exhausts it when de-energized. The second electro-magnet valve admits and exhausts air to the other end of the cylinder in the same way. Due to the arrangement of the control lever in the tower, only one magnet can be energized at a time, and, therefore, air is always forcing the switch to stay in the position.

All of this apparatus is controlled from central towers placed about the yard. Each tower controls certain retarders, switches and skates, for which a control board of an entirely new design is provided. The control levers for the switches and skate mechanisms are simply two-position switches, so arranged that each position is positive. The retarder control levers require more positions—one for release, one for normal (everything de-energized), and one of the pressures used. These levers are provided with springs and dogs so that each position is positive. The entire board is compact and accessible and so designed that the operator may sit or stand before it, and at the same time see over the top of the is controlling. All of this apparatus uses six-volt, direct current energy, supplied by storage battery, for the control mechanism.

Pennsylvania Plans to Advertise*

By General W. W. Atterbury
President, Pennsylvania Railroad

IT has been my job all my life to try to get things done. It is your job to tell about them after they are done, or even before they are done. And I am not sure but that things often get done a great deal better because the public has been told they are going to be done, than would be the case if the telling had not been done.

For a great many years it has been one of the operating rules of our railroad that whenever there is serious delay to a train, the crew of the train shall go through the cars and advise the passengers as to the probable length of the delay. This rule has been on the books for a long time, and had been as often honored in the breach perhaps as in the observance; but one day we made an announcement

to the public that such was the policy of the road, whereupon we found that the crews of trains were far more diligent in carrying out this regulation than had been the case before.

I am not only a great believer in telling the public what you are doing, and especially telling the public what a railroad is doing,—for, indeed there are no secrets in the operation of a railroad,—but I am also a firm believer in straight-away advertising. I am hopeful that within the near future the Pennsylvania Railroad may embark upon a plan of national advertising which will make the people understand, and make our employees understand, the ideals of our management and the fundamental standards of our service.

When we start our advertising campaign I want to invite the co-operative interest and criticism of the whole advertising fraternity. Do you realize that our railroad serves 13 states and the District of Columbia, and that it reaches with its rails some half the population of the United States? In a very real sense we are public servants. Upon the efficiency and effectiveness with which we do our job depend, in a substantial degree, the prosperity and well-being of this whole people. Therefore, when you make suggestions to us you will have a right to feel that those suggestions are not merely for the benefit of the Pennsylvania Railroad, but that they are really in the public interest.

At any rate, I personally want to tell you that every constructive suggestion and criticism I can get from any source regarding the service and possible improvement of the efforts of the Pennsylvania Railroad will be deeply appreciated. Not only will it be appreciated, but, wherever possible, the benefit of such criticism or suggestion will be made available to the public.

What is the advertising problem today of a great railroad like ours? It is not merely to get additional passengers upon our luxurious trains. We want these passengers, and are quite prepared to spend money to get them, but that is not our most important problem at the present time. Those of us who are responsible for the operation of a railroad property must view the situation as a whole. The Pennsylvania Railroad, for instance, spends \$500,000,000 a year in operating expenses. Of this amount some \$375,000,000 is paid in the form of wages to about 200,000 employees. These employees perform duties of a most varied character. Necessarily, many of these duties are performed without any supervision on the part of superior officers. These duties are performed by the great majority of the employees with fidelity and care, for without that steady performance of duty it would not be possible to operate a railroad successfully. But we all know there is a great difference between doing anything with fidelity and care, and doing it with real enthusiasm, with interest, and with a determination to extract the utmost possibilities out of the endeavor.

When 200,000 employees are at work upon a situation you can readily appreciate that a little additional effort upon the part of each of these employees will make an enormous difference in the result as a whole. Now if we can increase the efficiency of these employees by even so little as 5 per cent, you can see that we would reduce our operating expenses by \$25,000,000. This is 5 per cent on our capital stock.

Furthermore, if each of our employees did his job just a bit better than he does it today you can see that passenger train performance would be improved, freight trains would go through more promptly, people would get their deliveries of freight in better condition and in better time, and the result would be that every patron of our road would be better pleased with our service and would himself become a solicitor for business.

*From an address before the Advertising Club of New York, February 3, 1926.

Here, then, is our real goal in connection with our present advertising plans: not alone an increase in the number of travelers on our trains, but, first of all, the cutting down of operating expenses, and, secondly, producing greater satisfaction on the part of our patrons by reason of the improved character of the service we render.

The product which a railroad has to advertise is a very different thing from that of a manufacturing company. Our problem is primarily one of improving the service which we render, making it more and more satisfactory to the people who utilize this service, and gaining the confidence, good will and active co-operation of all our employees.

Train Stop Installations Approved

I. C. C. approves Sprague device on Burlington and Great Northern

THE Interstate Commerce Commission on January 30 made public orders dated January 26, by Division I (Commissioners Mayer, Esch and McManamy), approving with certain exceptions the installations of the automatic train-stop system of the Sprague Safety Control and Signal Corporation on the Creston division of the Chicago, Burlington & Quincy and the Minot division of the Great Northern, finding in each case that the requirements of its specifications and order have been met, except as noted. This device is of the intermittent magnetic induction type with forestalling feature.*

Report on Burlington Installation

This device was first installed on a 20-mile section between Creston, Ia., and Corning, Ia., in December, 1924. At this time 25 track magnets were installed and eight locomotives equipped. In February, 1925, a preliminary inspection was made by representatives of the Bureau of Signals and Train Control Devices and a report was made to the carrier on March 27, 1925.

The installation now inspected was completed on July 14, 1925. It extends from Creston, Ia., to Pacific Junction, Ia., 82.1 miles, of which 24.4 miles is single track and 57.7 miles double track. There are 56 equipped locomotives.

The cost of this installation to date as reported by the carrier, covering wayside and locomotive equipment, is subject to possible unimportant revisions:

1. Total cost of the train control installation, less signals and cost of changes in existing signal system, less salvage....	\$126,576.39
2. Total cost of changes in existing signal system made necessary by train control, less salvage.....	39,166.68
3. Total all other costs.....	
Total cost of installation (train control).....	\$165,743.07

The automatic signal system was installed in 1917-1918 and throughout the double-track section consists of non-overlapped normal clear two-position lower quadrant one-arm home or distant and two-arm home and distant, electric-lighted, Federal, Type "4," top post mechanism ground signals on concrete foundations. Approach lighting is used throughout and advantage is taken of this arrangement to simultaneously energize the roadside train-stop magnet at a clear signal. Current for operating the signals and track magnets is furnished by Edison 500 a.h. caustic soda batteries housed in concrete wells.

On the double track portion of the train control zone there are 46 one-arm home signals, 46 one-arm distant signals and 31 two-arm home and distant signals. On the single track there are 18 one-arm home signals and 18 one-arm distant signals and 11 two-arm, home and distant signals.

There are four interlocked home signals. Home automatic signals indicate "stop and proceed," except a few "grade" signals which may be passed at a speed of five miles an hour, and the "absolute stop" signals at the leaving end of passing sidings in single track territory. Distant signals are located a minimum distance of 2500 ft. from the home signals and indicate the position of the home signals. The home and distant signals are two-arm signals, the lower arm being the distant signal for the next home signal ahead.

*A description of the train control installation on the Great Northern, including a detailed explanation of the operation of the intermittent inductive form of train stop, as made by the Sprague Safety Control & Signal Corporation, was published in the *Railway Age* for January 10, 1925, page 183.—EDITOR.

WASHINGTON, D. C.

There is a total of 121 track magnets, located as follows:—In double track territory there are 11 magnets at home signals, 46 magnets at distant signals, 28 magnets at "home and distant" signals and eight magnets on exit ends of sidings. In single track territory there are 14 magnets at distant signals and 14 magnets at double signal locations. The magnets at distant and at "home and distant" signals are stop magnets when the home signal in advance is at stop. The magnets at home signals are stop magnets when the block in advance of signal is occupied. The magnets at home automatic signals are generally referred to in this installation as "starting" magnets.

The track magnets on sidings are placed just back of the derail, and are "stop" magnets at all times, not being in any way connected with the wayside signal circuits.

The track magnets are located between the rails, and between the insulated joints. The top of the housing is one inch below the top of the rails. Track magnets at signal locations check the signal in its governing direction and allow movements in the opposite direction without interference.

Protection against accidental displacement for all magnets except those on sidings is accomplished by using the core of the deflecting coil of the track magnet as part of the track circuit in the rear.

Fifty-six road locomotives are equipped with train-stop apparatus; 23 for passenger service and 33 for freight. Thirty of these locomotives were inspected in service, the remainder being in shops undergoing repairs or stored.

Conditions

As a result of this inspection and test, it was found that the installation meets the requirements of the commission's specifications and order except as noted below, and, therefore, it is approved except as hereinafter indicated:

1. **Exception:** Since overcharging of the capacity reservoir may interfere with or prevent an automatic service reduction in the equalizing reservoir and brake pipe, adequate means must be promptly applied on all locomotives to prevent such overcharging.

Inspection. 1. Arrangements should be made for careful inspection and test of the train stop equipment on all locomotives operated in train stop equipped territory upon arrival at and departure from designated inspection and repair points. This inspection and test should include all parts of the apparatus. All seals should be inspected to see that they are unbroken. Before departure from terminals it should be known and recorded that the apparatus is properly cut in service. A daily report as to the condition of the apparatus should be made on a form provided for that purpose and forwarded by the inspector to a designated officer.

2. Periodical inspection and test should be made to insure that there has been no deterioration of the magnetic qualities of the track magnets, reports being made on a form provided for that purpose and forwarded by the inspector to a designated officer.

3. The possibility of reducing the magnetic strength of a track magnet by a reversal of the deflecting coil current at the potential used in this installation was demonstrated during the inspection and tests; and measures should be taken to prevent this by (a) insuring the battery voltage designated by the Sprague company, and (b) applying connectors for the track magnet circuits of such construction as to prevent wrong attachment.

4. In this installation the automatic exhaust from the equalizing reservoir is made through a service application valve in the brake valve head. The proper operation of this valve depends upon the maintenance of the integrity of the connecting pipe between the oil reservoir and this head, and of the movable parts in the latter. The Sprague company has an alternative, inter-

changeable construction in which the automatic exhaust from the equalizing reservoir is made at the pilot or vent valve, and this alternative interchangeable construction is here brought to the attention of the carrier for consideration.

5. The train stop apparatus in this installation is adjusted to make a 10 lb. reduction on freight locomotives and a 20 lb. reduction on passenger locomotives. If a common reduction for passenger and freight service is not considered desirable, it is very important that the change be made to the proper reduction port of the cut-off valve when other than regular passenger locomotives are to be used in passenger service. This was overlooked in one instance during the time of the recent inspection.

6. The cab indicator light as used on this installation shows a green light at all times if the stick relay is energized, whether in train control or non-control territory. This green light remains after the engineman has forestalled and is running in either a caution or a stop block. It does not give, and is not intended to give, any indication as to the condition of the block.

It is suggested that the carrier may desire to consider whether the use of other than a color of standard signal significance is not preferable.

Signals

1. The control for automatic distant signals should be such as to insure that these distant signals will indicate caution, and the magnets at the distant signals to be in stop condition, should the home signal stand falsely clear due to mechanical trouble or sleet.

2. It is suggested that the interval between stop-indication points and home signals be given careful consideration with a view of making sure that safe braking distance is provided for trains at high speed and for freight trains having the 10 lb. adjustment. This is especially important in the absence of overlap.

Great Northern Report

This device was first placed in service on the Great Northern between Minot, N. D., and Berthold, N. D., 23 miles, with six equipped locomotives. A preliminary inspection of this 23-mile installation was conducted in November, 1924, and a report as to the results of this inspection made to the carrier on January 26, 1925. The installation now inspected was completed in October, 1925. It extends from Minot, N. D., to Williston, N. D., 120.3 miles, of which 98.07 miles is single track and 22.25 miles double track. There are 35 locomotives equipped with the device.

The cost of this installation to date, as reported by the carrier, covering wayside and locomotive equipment, and subject to possible unimportant revisions, is as follows:

Work on Roadbed:	
Investment in road	\$79,618.07
Operating expense	4,951.47
	\$84,569.54
Additions to Equipment:	
Investment in equipment	\$34,441.41
Operating expense	19,930.39
	\$54,371.80
Less cost of speed governors not applied. Decision of July 18, 1924	10,500.00
	\$43,871.80
Total net cost of actual installation	\$128,441.34

The A. P. B. signal system used throughout this section has been modified, so that signals are overlapped for following moves, except distant signals for the entrance signals to passing sidings; and the opposing overlap control from siding to siding has been extended the length of each siding between head block signals. The system employs normal clear, three position, upper quadrant, electric lighted, G. R. S. Model 2A top post mechanism ground semaphore signals controlled by polarized line circuits.

Where an overlap is provided for following movements the stop magnet is at the stop signal while in other cases the stop magnet is located braking distance from the stop signal. There are 32 cases falling within the latter class where a stop magnet is effective at the caution distant signal to an entrance signal for a passing siding, eight cases where magnets located at single signal locations governing train movements in opposite direction are stop magnets with the entrance signal for the passing siding at stop, and three cases at signals 1.3, 57.7, and 98.1, where a stop magnet is effective where a distant signal, to its respective absolute stop signal is at caution.

There are eight cases where caution distant signals to an entrance signal for a siding give a clear magnet.

Signals 1.4, 99.8 and 120.7 are distant signals to home interlocked signals and give a clear magnet when displaying a caution indication.

The double track from Williston eastward to Wheelock converges into single track at the latter place over a mechanically operated crossover, the eastbound main line continuing for 5700 ft. as a

passing siding. There are at this point two, two-arm semi-automatic signals governing movements eastward and westward, and one dwarf signal governing reverse movements eastward from the westbound main track to the single track. There is no signal governing movements westward from the passing track to the eastward main track.

At Minot a passing track extends from the Soo Line crossing to a point about 11,000 ft. west thereof, where it converges with the main line. At this point a remote controlled interlocked switch is employed and protected by two, two-arm semi-automatic signals governing movements westbound and one two-arm semi-automatic signal governing movements eastbound. The eastward distant signal does not display a more favorable indication than caution, in which position the track magnet is at stop.

There are, in this installation, 132 magnets for 312 signals located as follows:

- 80 magnets are at 80 double signal locations on single track.
- *8 magnets are at 8 single signal locations on single track.
- 43 magnets are at 43 single signal locations on double track.
- 1 magnet is at east entrance to train stop territory.

132 Total number of magnets.

*These eight magnets govern in each direction, as at double signal locations.

The track magnet consists of ten permanent magnet bars arranged in two groups of five each, with an electro-magnet interposed between. For physical protection the assembly is enclosed in a manganese steel casing.

Two methods have been employed to check against accidental removal of track magnets. Wherever possible, the line control circuit for the signals approaching a specific magnet from either direction have been placed in series with the magnet winding so that any interruption of this circuit will put these signals and their magnets at stop. At points where this method of checking is not practicable the magnet core has been connected in series with the immediate track circuit, so that its removal would affect signals governing approach from either direction in the same manner.

Thirty-five road locomotives are equipped with train-stop apparatus; 10 used in passenger service and 25 in freight. All engines in service were inspected.

The same exception is noted as in the Burlington report and the requirements as to inspection tests and maintenance numbered 1 to 4 are repeated, but those numbered 5 and 6 are omitted. The Sprague Company has an alternative interchangeable construction in which the automatic exhaust from the equalizing reservoir is made at the pilot or vent valve, and this alternative interchangeable construction is brought to the attention of the carrier for consideration.

Conditions, Etc.

1. It is suggested that the interval between stop-indication points and home signals be given careful consideration with a view of making sure that safe braking distance is provided for trains, the locomotives of which may have their reduction port adjusted for a reduction as low as 15 lb., particularly at points where the overlap is relatively short.

2. The arrangement under which, in some cases, a caution distant signal for an entrance signal at a siding gives a stop magnet while others give a clear magnet is believed to be undesirable, especially since in the latter cases there is no visual indication to the engineman of the condition of the intermediate track magnet between the distant and entrance signals. It would seem to be better practice to have all caution distant signals to entrance signals for sidings provide a stop magnet, in the absence of overlap.

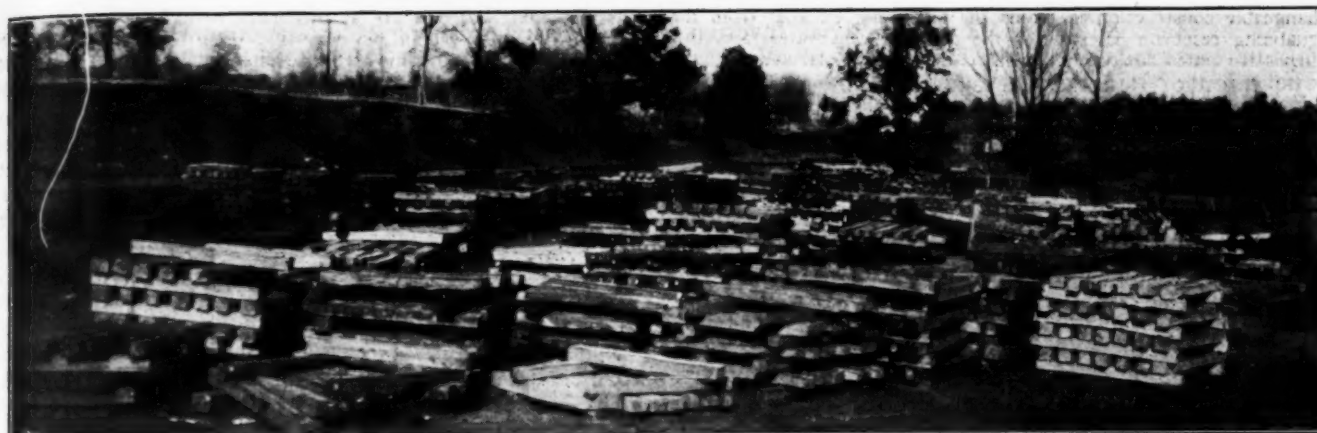
3. In addition to the signals now giving a stop magnet with a caution signal indication, the following signals should give a stop magnet with the signal at caution:

- Signal 1.4 Distant signal for E. B. home signal, Minot.
- Signal 99.8 Distant signal for E. B. home signal, Wheelock.
- Signal 120.7 Distant signal for W. B. home signal, Williston.

4. Protection should be provided against unauthorized train movements westbound from the eastward passing track at Wheelock to the eastward main track.

5. The overlaps for Signals 46.3 and 54.2, falling within centered track circuit sections, the control circuits for these signals should be carried through both track relays of their respective overlap track sections, if this condition is to be continued.

6. It is suggested that careful consideration be given to the possibility of securing increased fouling protection at main line crossovers, and to the desirability of installing switch boxes on derrails and switches at the siding end of crossovers between main tracks and sidings.



Ties Awaiting Acceptance by the Railroad

Tie Producers Discuss Prices and Problems

President Burnett of Nickel Plate urges stabilization of purchases at annual convention

THE likelihood of higher prices and the need of greater stabilization of purchases, and encouragement of tie treatment were among the characterizations of the tie production situation as it was discussed in its various aspects at a well attended annual convention of the National Association of Railroad Tie Producers, in the Hotel Cleveland, Cleveland, Ohio, on January 28 and 29.

In opening the convention Howard Andrews, president of the association and also president of the Nashville Tie Company, reviewed the activities of the past year from the standpoint of the tie producer. He stated that last year was one of limited demand, resulting from a large carry-over of ties from the preceding year. He also referred to the reductions in demand that are resulting from the increased number of ties treated. He called attention to the fact that a fluctuation in demand for ties constitutes a heavy tax on the production cost and sounded a recommendation for conservatism in production activities.

In welcoming the convention to Cleveland, J. J. Burnett, president, N. Y. C. & St. L., referred to the great progress that has been made in the standardization of ties in recent years and emphasized the necessity for further stabilization of purchases to enable production to be maintained more uniformly, and the cost of production to be reduced. He also urged tie producers to encourage the treatment of ties as a means of postponing the introduction of substitute ties. It has been demonstrated that treatment enables the annual cost of a tie to be reduced and since this annual cost is a determining factor in the selection of ties, treatment has arrested the rising cost of ties and delayed the introduction of ties of other materials.

E. E. Pershall, vice-president, T. J. Moss Tie Company, St. Louis, Mo., representative of the association on the American Engineering Standards Committee on Cross Ties, reported that since the last meeting the standardization of tie specifications by the sectional committee of the American Engineering Standards Committee had progressed to the point that unanimous agreement had been

reached. The National Association of Railroad Tie Producers had been unsuccessful in its contention for a tolerance of $\frac{1}{2}$ in. in the width of ties, and has accepted the tolerance of $\frac{1}{4}$ in. upon which the remainder of the committee agreed. The American Engineering Standards Committee's sectional committee on ties will now refer the proposed standards to the sponsors, the American Railway Engineering Association and the United States Forest Service, for approval and transmission to the main committees of the American Engineering Standards Committee.

A committee was appointed with E. A. Nixon, Western Tie & Timber Co., chairman, to suggest to the railroads the advisability of their studying the conditions of tie production with the idea of co-ordinating their requirements with the conditions confronted by the tie producers in an effort to increase the consumption of the smaller sizes, grades 1 and 2, by confining the larger sizes to those lines of heaviest traffic.

E. E. Pershall was appointed chairman of a committee to present to the railways the belief of the producers that a round tie 7 in. thick and 7 in. wide (on top) is superior to a tie 6 in. thick and 8 in. wide (on top) with a view to having its price placed higher than the 6-in. by 8-in. tie.

Colonel W. B. Greeley, forester, U. S. Department of Agriculture, Washington, D. C., speaking at the annual dinner, traced the increasing necessity for reforestation as transportation becomes an increasingly large part of the cost of forest products owing to the recession of the forests from industrial centers and other points of consumption.

Other addresses presented at the convention in addition to those abstracted below, included a review of The Business Outlook by John C. Howell, chief of the commodity department, The Brookmire Economic Service, New York; "Tie Siding, How and Where to Sell It" by Arthur T. Upson, National Lumber Manufacturers' Association, Washington, D. C.; "The Importance of the Tie Industry in Our Program of Forest Thrift" by R. D.

Garver, assistant chief, Section of Industrial Investigation, Forest Products Laboratory, Madison, Wis. and "The Effect of Railroad Consolidations" by E. T. Howson, western editor, *Railway Age*.

At the session of the convention on Friday the following officers were elected for the ensuing year:

President, John T. Logan, president, National Lumber & Creosoting Co., Texarkana, Tex.; 1st vice-president, C. D. Christian, Standard Tie & Timber Co., Meridian, Miss.; 2nd vice-president, J. A. Tiller, Johnson & Tiller, Little Rock, Ark.; secretary, E. A. Morse, vice-president, Potosi Tie & Lumber Co., St. Louis, Mo.; treasurer, R. M. Killey, Acme Tie Co. of Michigan, Reed City, Mich.; district directors: Pacific Coast District, E. H. Meyer, vice-president and general manager, Charles R. McCormick Lumber Co., Portland, Ore.; Rocky Mountain District, Otto Gramm, president, Fox Park Timber Co., Laramie, Wyo.; North Central District, W. J. Foye, Foye Lumber & Tie Co., Omaha, Nebr.; Northeastern District, F. C. Parrett, general manager, Baker Wood Preserving Co., Washington, C. H., Ohio; Southeastern District, W. W. Andrews, secretary and treasurer, Nashville Tie Co., Nashville, Tenn.; South Central District, John Fuhrer, secretary and treasurer, Egyptian Tie & Timber Co., St. Louis, Mo.

Nashville, Tenn., was selected as the location for the next convention.

J. H. Waterman Urges Selection for Use

J. H. Waterman, superintendent of timber preservation, C. B. & Q., Galesburg, Ill., dwelt at some length on the fact that in the last 40 years there have been marked increases in the sizes of tie plates, rail anchors, spikes and other parts which go to make the track structure, as well as enormous increases in the sizes of locomotives and rolling stock, while at the same time there had been no great increase in the size of cross ties. He expressed the opinion that one of the factors which reacts to the detriment of the tie-producing industry is the lack of proper distribution and contended that the tie-producers should educate maintenance of way men to the advisability of using the proper size cross-tie for individual purposes.

He brought out the fact that of the 400,000 miles of railroad tracks in the United States, approximately 150,000 miles consist of sidings and yard tracks, and that there is no excuse for putting large high-grade cross ties in tracks of such a character. He suggested the advisability of maintenance of way men analyzing the particular requirements of each class of track with the idea of using cross ties particularly suited to each. He also suggested the advisability of tie producers and railroad officers co-operating in the preparation of a "budget" for cross-tie requirements for different classes of track.

Tie Renewals Low in France

In reviewing his observations of cross tie conditions in Europe, Dr. Herman Von Schrenk, consulting timber engineer, St. Louis, contrasted the high cost of material and the cheapness of labor in Europe with the opposite conditions in this country. As a result the European railways have given some intensive study to the care of their timber, whereas in this country we do not regard ties or other material as highly. For many years the European railways have been endeavoring to secure the maximum of life from their cross ties, renewals on the French Eastern railway being 52 per mile of track in 1925, while Dr. Von Schrenk saw many ties in track carrying dating nails of 1873-75. At the same time they

have been developing reforestation until in many cases they are growing tie timber with sufficient rapidity to meet their demands. Furthermore, the merchandising of trees has been developed to such a high point in many parts of Europe that trees are cut with a view to all of the products they will produce rather than merely ties. In England track is rebuilt out of face at intervals of 20 years at which time about 25 per cent of the ties removed are classified as No. 1 ties and returned to main tracks for another 20 years' service, while 70 per cent are classified as No. 2, showing some decay in the heartwood and are sawed into posts, slabs, and similar forms, while the remaining five per cent of the ties are too far decayed for further use and are sawed up for engine wood. The railways of Europe, according to Dr. Von Schrenk, have learned to help themselves in the production of their tie supply.

Producers Must Meet Railroad Requirements

Among the special papers read before the association was one by E. R. Ross, Marsh and Truman Lumber Company, Chicago, on the responsibility of the producers in meeting railroad requirements. He spoke in part as follows:

"Years ago the railroads endeavored to secure nothing but white oak ties, complying with a general specification that required the tie to be six inches thick with no restriction as to face or percentage of certain widths. Today, our specifications are definite as to thickness and width and the railroads can place a value on each size needed as well as utilize practically all of the sizes and shapes that are made from the timber. By knowing the sizes they will receive the engineering departments of the railroads have been able to get the maximum value out of the timber by specifying the larger sizes for main line tracks and the smaller ties for side tracks, industrial tracks, etc.

"Many tie producers have been complaining about the restrictions the railroads are placing on their orders for cross ties in that they do not purchase enough of the smaller ties, i.e., No. 1 and No. 2, to utilize the woods run or natural production of the timber. In going into this matter I find that localities in the south and southeast produce most of the cross ties on saw mills, and make about 25 per cent of grades 1 and 2, and in the southwest where most of the ties are hewn and from small timber the natural production of grades 1 and 2 runs between 35 per cent and 50 per cent. As the southwest producers seem to be having the most difficulty in this respect you will be interested in excerpts of letters received from railroads depending upon that territory for their cross ties.

"The Missouri Pacific advises that this road uses all grades of ties, namely, grades 1 to 5, inclusive. We do not restrict the percentages of grades 1 and 2; in fact, we do not get enough ties of grades 1 and 2 for our side tracks and it is necessary that we use main line ties in our side tracks."

"The St. Louis-San Francisco advises that 'We do not specify any certain proportion of each grade and as we take all of the small ties offered it would hardly be to the advantage of the producers for us to specify a greater number than we have been getting. Most of the smaller ties which we are now getting are coming from the second cuts or tops of trees from which the larger ties are made, thereby making use of timber that would otherwise be wasted.'

"The railroads are keenly interested in the production of cross ties and I believe it is up to those that expect

to supply cross ties or other timber products to adjust their production to the railroads' present day needs. There is no question in my mind that the railroads require a larger tie than they did 25 years ago. In 1901 the Northern Pacific reports it was using rails weighing from 45 lb. to 80 lb. per yard, while in 1924 only 36 per cent of their rail weighed 80 lb. and less and 64 per cent weighed from 85 lb. to 130 lb. This same road reports that in 1901 328 tons of revenue freight were handled per train and in 1924, 629 tons. In 1901 the locomotive weight was 116,200 lb. and in 1924, 218,400 lb. In 1901 the freight car capacity was 26 tons and in 1924, 39.8 tons. This is typical of conditions on other Class I railroads. As heavier rail is used more and more, the demand will increase for the larger tie.

"As the cost of labor and of cross ties is getting higher year by year and as creosoting adds to the initial investment we should be careful to produce better ties of the sizes and kinds needed in order to prevent any substitute for the wooden cross tie coming in. Those producers that have convinced themselves that they are unable to make ties without 50 per cent of grades 1 and 2 should bear in mind that the Santa Fe has an annual requirement of three million cross ties, most of which are produced along their lines, and that they secure approximately 90 per cent of 7 in. by 8 in.—8 ft. and not over 10 per cent of 6 in. by 8 in. and 7 in. by 7 in."

Tie Producing Areas Report Conditions

An important feature of the programs of the Tie Producers Association is a review of conditions in the six districts in which the United States has been divided, presented by the directors of the respective districts. These reviews are abstracted below.

A Buyer's Market on the Pacific Coast

By E. H. Meyer

Vice-President and General Manager, the Chas. R. McCormick Lumber Company, Portland, Ore.

Ties have little to give them commercial distinction from other timber business on the Pacific coast. At no place in either Oregon or Washington can a mill of any capacity be found that cuts nothing but ties. The larger mills never cut ties except on orders permitting loading directly from the saw to the car or cargo dock so that the stocks unsold on hand are always confined to the small accumulations of ordinary No. 1 common 6-in. by 8-in. by 8-ft. and 7-in. by 8-in. by 8-ft., stock, that the little mills cut out of logs that will make nothing else conveniently.

The elevation of tie standards, together with a dearth of satisfactory timber cutting for the larger mills, has caused the plants that cut from 10,000 to 20,000 ft. per day to turn to the production of bridge plank and long dimension stock which their timber will make, and which bring them more money than the common ties. They do, however, saw a 6-in. by 8-in. or 7-in. by 8-in. tie when the log will make nothing else advantageously, and unfortunately during the past year the accumulation of the sizes, while at no time great, has been sufficient to permit the buyers to name their own prices.

With the larger inland mills the special specification tie business during the past year has proved a blessing, as they have been able to secure it in fairly large blocks that assured them cutting at a time when they would have otherwise been greatly inconvenienced.

A much greater variety of sizes is now called for than in former years. The western roads, which are by far the heaviest users of fir ties, are buying mostly 7-in. by 8-in.

by 8-ft., 7-in. by 9-in. by 8-ft., and 7-in. by 10-in. by 8-ft. sizes. Some lines buy more than one size, using lighter ties on the side tracks than on the main line. During the past year a considerable quantity of ties have moved to the Atlantic coast by water. Export orders call for a larger variety of sizes than the domestic business. Due to the great variety of sizes, it is impractical to cut or store ties without orders on the Pacific coast.

The year 1925 did not see a heavy footage of ties shipped to the export markets from Oregon and Washington. China took a fair supply and there were scattered orders for small quantities to other markets, but the bulk of the fir ties for export were cut by Canadian mills.

Ties on hand mean nothing on the Pacific coast as the ability of the mills to furnish this important item is capable of great expansion and is regulated only by price and the consequent desirability of ties as cutting business. When the larger mills can get timber orders, especially those calling for the regular export or domestic structural grades, they will not consider tie business unless there is a sufficient difference in the price.

The average price paid for ties during the year 1925 were about the same as the prices ruling during 1924, as follows: No. 1 common grade 6-in. by 8-in. by 8-ft., 7-in. by 8-in. by 8-ft., and 7-in. by 9-in. by 8-ft., ranging from \$14 to \$17 per 1000 ft. b. m. On special grade, similar to that used by the U. S. Railroad Administration during the war period, prices ranged from \$18 to \$21, with the price of \$19 prevailing most of the year.

No Profit in the Mountain District

By Otto Gramm

President, Fox Park Timber Company, Laramie, Wyo.

The tie situation in southern Wyoming is about normal. As the railways in the southern part of the state have a supply of ties on hand, the demand is not great although the tie producers have orders on hand for a normal amount of ties for 1926. In the northern part of the state an increased demand is anticipated. As a whole, the tie business has been good although prices have been cut about 10 per cent in the southern part of the state and will not show much profit for producers in 1926. The outlook for this year is that the production will be below normal because of the decrease in prices and the further fact that the railroads have reduced the number of ties that they will take.

Production Off in the South

By R. E. McKee

Assistant Manager, the Long-Bell Lumber Company, Kansas City, Mo.

In the south central district, which comprises Iowa, Illinois, Missouri, Kansas, Oklahoma, Arkansas, Louisiana and Texas, the weather has not been favorable for the production of ties during the last 90 days, especially in the four southern states, on account of the excessive rains which have made it difficult to produce and haul hewn ties and logs. In some sections the supply of labor has also been short, while in other sections there appears to be a plentiful supply, although usually of an inefficient and indifferent type. Improved farm conditions and a good cotton crop have taken a large amount of the better labor as the farmers have been in a position to pay better wages. As a result of these conditions, production throughout this district has been less than normal, while the stock of ties in the hands of the producers is lighter than at any time during the last three years. The demand

for cross ties has also been light during the past 90 days as a result in part of ample stocks of cross ties by the railroads, and also due to the reduced demands as a result of treatment. In view of the present light demand and the light production, it is reasonable to expect a higher market for cross ties in all woods. This is further supported by the fact that it is becoming necessary to procure ties at further distances from the railroads while stumpage values are constantly increasing.

Rains Retard Production in Southeast

By H. C. Woolf

The Harmount & Woolf Tie Company, Winchester, Ky.

This district includes Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi, the district normally producing a large number of ties, chiefly oak, cypress, pine and gum.

The production of ties in this district during 1925 was the smallest for several years. To some extent this is accounted for by bad weather conditions and a labor shortage in some sections, but it is caused chiefly by a small demand and likewise low prices. Many mill men who formerly cut cross ties have found it more profitable to cut lumber as lumber prices throughout the district have been good and are getting better at present. The high price of stumpage is also having its effect on the production of ties.

During October the market revived a little when orders for some 350,000 mixed oak, sap pine, and gum ties were placed in the south to be shipped by water to eastern ports. However, few of these ties have been shipped. The demand for ties in this district for shipment to northern roads has been light, but the demand from the local roads has been sufficient to take care of the production of the kinds of ties they use. For the past few months, the demand from the local roads have been increasing and a few of the roads have not only been buying all the ties they could on their own lines, but have buyers out over a large part of this district buying ties to take care of their immediate requirements. This sharp demand has caused an increase in price of five cents to ten cents with an additional increase likely.

The demand from the roads traversing this district promises to be good for the coming year and on account of such few ties being produced at present, something must be done to increase the production if these roads are to get their requirements when needed. The demand of the northern roads for ties to be shipped by rail is increasing but promises to continue light for the coming year, while the demand for ties for coastwise shipment to eastern ports is increasing and will likely be about normal.

Stocks of ties now on hand are smaller than for many years. The yards of some of the treating plants are fairly well stocked with ties now in the process of seasoning but there are scarcely any ties to be found along the line in the producing territory ready for shipment.

Production Greater in the North

By M. H. Schussler

Minneapolis, Minn.

The North Central district includes Minnesota, Wisconsin, Iowa, North Dakota, South Dakota and Nebraska, of which Wisconsin and Minnesota are the only states which produce any amount of ties. The production in these two states for the winter 1925-1926 will be considerably less than last year. The production of soft wood

ties, viz: tamarac, cedar and hemlock, will be lighter than for any year in the past few years, but the hardwood ties are in better demand, and the production will be greater than last year.

The railroads in this district are buying approximately the same number of ties as last year, increasing their purchases of hardwood and decreasing their purchases of soft wood. Last year's purchases, however, were less than normal, so the demand will not be as large as the dealers expected.

The tie market for soft wood ties is far from satisfactory, but the hardwood ties are in demand, and prices on the No. 4 and the No. 5 especially, are considered very satisfactory.

The small tie producers in this section are principally of small financial resources and must have the assistance of either the railroads or the larger dealers before they can produce. The larger dealers are proceeding cautiously, and even though the railroads should come into the market during the next 30 days, the production this winter is bound to be light, as it is too late to stimulate production very much.

It is hard to predict the future of the tie industry in this district. The amount of standing timber in this district is being reduced continually, and there is a tendency among the producers who own their own stumpage to conserve their standing timber and wait until prices are such that they can realize a profit by manufacturing their own timber, so what ties are produced this year will be largely from settlers who still have small amounts of timber left or timber from lands on which timber permits are expiring, which will compel some producers to operate.

Generally speaking, the production in this territory will be approximately 25 per cent less than last year and last year's production was less than normal.

Flourishing Conditions in Northeast

By R. M. Killey

Acme Tie Company of Michigan, Reed City, Mich.

The Northeastern district, including the region north of North Carolina and east of Wisconsin presents many widely varying conditions in the cross tie industry.

During the past season, New England tie producers, especially those making hardwood ties of the standard grades had ready sale for their products at satisfactory prices.

In portions of New York, New Jersey and Pennsylvania, recent years have shown a marked increase in the production of local ties.

In the upper peninsula of Michigan there was a heavy production of cedar ties during the winter of 1924-1925; in fact, the production was such that a considerable number of cedar ties were carried over by the producers into the 1926 season. In both upper and lower Michigan the demand of the local railroads took all of the native hardwood ties, principally hard maple and beech, which were produced.

In southern Ohio the production of ties was low during 1925. The demand during a portion of the year was not active, but the stock of standard ties left on the producers' hands at the end of the year was low. In portions of West Virginia the production exceeded the demand during the first half of the year but the demand during the latter part of the year took the surplus from the producers' hands. In Maryland and Virginia the production of ties during 1925 showed an increase over the previous year due to an increased local demand for ties by some of the railroads serving those states.

Wible L. Mapother Dead

Louisville & Nashville executive carried on policy established while he was assistant to predecessor

WIBLE L. MAPOTHER, since March, 1921, president of the Louisville & Nashville, died of heart disease at Panama on February 3. Mr. Mapother had been on the Isthmus since January 26 on a visit. He was accompanied by Mrs. Mapother and W. R. Cole, president of the Nashville, Chattanooga & St. Louis, and Mrs. Cole. The party had planned to return to the United States on February 4.

Mr. Mapother, although the head of a large and remarkably prosperous railroad system, had never been greatly in the public eye. He was a native son of Louisville, Ky., the headquarters of the railroad which he served for some 38 years, and was accorded the favor owing to him as a prominent and well-liked member of the community. Louisville & Nashville efficiency of operation and the general merit of the service given by the railroad to the great area through which its lines extend apparently helped Mr. Mapother to secure a degree of popularity in the South that he did not seem to seek or attempt to cultivate by public appearances on the platform or by messages in the public press.

The Louisville & Nashville was a prosperous carrier when Mr. Mapother became its chief executive and has been favored with even greater prosperity since. From the standpoint of general policy there have been few important changes in the brief five years of his administration.

The only features that stand out are the 62½ per cent stock dividend paid in May, 1923, and the recent leasing jointly with the Atlantic Coast Line of the Clinchfield. The terms under which acquisition of the latter was approved by the Interstate Commerce Commission have not yet been carried out. The problem of building the mileage which will effect physical connection between the Louisville & Nashville and the Clinchfield and of co-ordinating the operations of the two properties remains for Mr. Mapother's successor. The application for approval of the routes of the new lines was filed with the Interstate Commerce Commission only this past week. The fact that there has been no particularly important change in policy does not indicate that great things were not done on the Louisville & Nashville during Mr. Mapother's administration. Mr. Mapother, of course, brought the property through the transition period following federal control. He guided its operations through the shopmen's strike of 1922 when because of the heavy tonnage of coal

being brought out from Louisville & Nashville coal areas, most determined effort was made to tie up its operations. The signal feature, of course, has been the remarkable expansion of the coal tonnage in recent years. The Louisville & Nashville, as was noted in an article entitled, "Louisville & Nashville Earnings," in the *Railway Age* of January 23, 1926, has derived great benefit from its serving non-union mines in eastern and southeastern Kentucky. As a result it has had increasing prosperity of a degree that rivals that of the roads in the Pocahontas region and

which has its equal only on the roads serving Florida. The marked expansion of the coal tonnage has unquestionably required much careful thinking and consistent adherence to definite policy on the part of the Louisville & Nashville management.

The policy has been to spend large sums for yard facilities, double-tracking and realinement but the road has never been rushed into opening up new coal areas and to seeking a greater tonnage of coal than the railroad facilities were equipped to handle. Mr. Mapother did not solve the problem that has until recently been the chief burden of Louisville & Nashville progress—the problem of car supply. The road delivered much of its coal to off-line points north of the Ohio river. In times of peak business it had the greatest difficulty in securing the return of the cars which were often held for loading in more northern

coal fields or delayed on their return by congestion at Cincinnati. The fact that the union mines north of the Ohio are now operating on a smaller scale due to the disadvantage of the high wages of the Jacksonville agreement has in the past two years assisted the Louisville & Nashville greatly. The Louisville & Nashville expects to benefit markedly from the standpoint of car supply from the Clinchfield acquisition but as above noted this has not yet been carried to fruition.

There are many reasons why there were few important changes in Louisville & Nashville policy during Mr. Mapother's administration. Foremost is the fact that Mr. Mapother worked so closely with his predecessor, Milton H. Smith, and was for a long period high in the executive councils. It was remarked on all sides when Mr. Mapother became president that he would be expected to carry on with policies already established either by Mr. Smith or by himself as executive vice-president, and that is what was done. Particular comment was also made at the time



W. L. Mapother

of Mr. Mapother's loyalty to the property and to Mr. Smith. Indeed, it was said that about a year before Mr. Smith died, the veteran executive wished to resign so as to permit Mr. Mapother to succeed him as president in name as well as in fact. Mr. Mapother, however, used his influence to prevent this step and said at the time he intended to do all in his power to induce Mr. Smith to remain as president as long as he lived although the latter's resignation would have meant his own immediate advancement. Of this the *Railway Age* said, "Such traits of character have won for him the confidence of the owners of the property and the unswerving loyalty of his organization."

Wible L. Mapother was in the service of the Louisville & Nashville for a continuous period of 38 years, all his business life having been spent with the company. He was born in Louisville, Ky., September 28, 1872. After a grade school education he entered the employ of the railroad as an errand boy and file clerk in the office of the secretary. In August, 1889, less than a year after he had started to work, he attracted the attention of Mr. Smith, who was then vice-president, and who at once transferred him to the clerical force in the executive department. This step marked the beginning of a long and intimate association which ended only with Mr. Smith's death.

In May, 1902, he was made chief clerk in the executive offices. His next promotion, on July 16, 1904, made him assistant to the president. In this capacity his thorough knowledge of the affairs of the road, and his ability to lift burdens of administration from the shoulders of the president were so outstanding that on February 16, 1905, he was elected first vice-president. He was elected a director of the Louisville & Nashville on October 7, 1914. In November, 1915, he also became vice-president of the Lexington & Eastern, which had been acquired by the Louisville & Nashville in 1912.

During the period of federal control he was appointed federal manager of the Louisville & Nashville and the Louisville, Henderson & St. Louis, his jurisdiction being later extended over the Nashville, Chattanooga & St. Louis, and the Tennessee Central, and then over the Birmingham & Northwestern.

On February 28, 1920, when the Louisville & Nashville system was turned back to private control, Mr. Mapother resumed his position as first vice-president. As chief executive officer, he relieved Mr. Smith of many of his duties, thereby being peculiarly prepared to succeed him as president in March, 1921.

LAPEL BUTTONS will be awarded by the Southern Pacific (Pacific system) to six employees, one from each division and the general shops, who did the best work in the 1925 safety campaign.

T. C. Powell on Waterways

WASHINGTON, D. C.

T C. POWELL, president of the Chicago & Eastern Illinois, was one of the speakers at the annual convention of the National Rivers and Harbors Congress on December 10. Discussing the subject "Co-Operation vs. Competition," Mr. Powell concluded his remarks as follows:

"Where the system of water navigation, whether by canal, lake, river or ocean, can sustain itself on the traffic handled and at the same time afford a better and cheaper service, it should be encouraged.

"I see no objection to the national government issuing bonds in large amounts to provide for the completion of the recommended projects which contain the above elements, provided that the scheme also insures payment of the interest charges on those bonds out of the revenues of the carriers operating on such bodies of water.

"It is only under such a plan as this that the development of the inland waterways of the country can be put on a substantial and permanent basis, and I believe that if this suggestion can be included in the records of this Congress, it will go further toward the development of a national system than anything else. To sum up:

"1. It has been demonstrated that inland water navigation service limited to traffic originating and terminating at the water ports, and solely as a competitive service, as compared with the rail service, has not been successful.

"2. It has been demonstrated by the Cumberland Route, operating in connection with the Southern Railway; by the St. Louis & Tennessee River Packet Company, operating on the Mississippi and Tennessee Rivers, in connection with rail carriers; by the Great Lakes Transit Corporation, operating in connection with the trunk lines at Buffalo; by the Detroit and Cleveland Navigation Company, operating in connection with rail lines through Cleveland; and by many other co-ordinated water and rail operations, that, when properly handled in this way, joint rail and water navigation can be made a success.

"3. We should recognize that commerce demands a system of communication which combines economy, speed, certainty, convenience and safety, and that without all these elements, no system of transportation can long prevail.

"4. It has been demonstrated, through a period of years, that cut-throat competition between boats and railroads does not pay.

"5. Finally, in any conception of transportation for the United States, we must consider the country and the commerce of the country as a whole."



B. R. & P. Water Supply Reservoir, Ketner, Pa.

General News Department

The Illinois Central plans to celebrate its 75th anniversary on February 10, the road having received its charter on that date in 1851.

W. H. Finley, former president of the Chicago & North Western, will address the Western Railway Club at its next meeting to be held in Chicago on February 15.

The Midland Valley has taken out a group life insurance policy for the benefit of its 1,100 employees from the Prudential Insurance Company, Newark, N. J.; amount covered, about \$1,800,000.

A. J. Manson, manager, heavy electric traction, Westinghouse Electric & Manufacturing Company, will address the Cincinnati Railway Club at its next meeting, to be held on February 11.

The Society of Terminal Engineers at its next meeting to be held in the Engineering Societies' Building, New York, on February 9, will hear an address on "Commercial Airport Terminal, New York Metropolitan District" by Paul Henderson, general manager, National Air Transport, Inc.

The hearing on the complaint of the Sprague Safety Control and Signal Corporation, alleging that the automatic train control system which the New York Central has contracted for with the General Railway Signal Company is unsafe, was resumed at Washington on February 3 before Commissioner McManamy and Examiner Mullen of the Interstate Commerce Commission.

The Louisville & Nashville has recently held its regular annual dinners at which service emblems are given to old employees. That for the Nashville division was held at Nashville on January 29, and about 75 employees received the badges of honor. Three men, having each served 50 years, received gold buttons, set with diamonds. These three were George M. Adams, conductor; M. Collins, engineman, and A. H. Shields, agent. For 45 years' service, gold buttons are given; for 35 years, buttons of silver and enamel; for 25 years, silver, and for 15 years, bronze.

Bill to Refund Railway Indebtedness to Government

A bill proposed by the Railroad Owners' Association, providing for the refunding within a period of not exceeding 40 years, at not less than 4 per cent, of railroad indebtedness to the government arising from the period of federal control, has been introduced in the Senate by Senator Gooding as S. 2929, and in the House by Representative Merritt as H. R. 8708. The bill covers indebtedness to the Railroad Administration, as well as loans made by the Interstate Commerce Commission, and authorizes the Secretary of the Treasury to make arrangements for the extension of the time of payment or for exchange of securities or substitution of collateral. It is also provided that the agreement of extension shall provide for the payment each year, by way of amortization, of an amount, in addition to interest, designed to discharge the indebtedness at the end of the period of extension, reserving to the carrier the right to pay the whole or any part of the principle on any semi-annual interest date.

Senator Butler of Massachusetts has introduced a bill, S. 2934, similar to that which he introduced at the last session of Congress, "to promote the flow of foreign commerce through all ports of the United States" by preventing the maintenance of "port differentials and other unwarranted rate handicaps."

Senator Smith of South Carolina has introduced a bill, S. 2926, similar to that introduced in the House by Mr. Rayburn, to authorize the Interstate Commerce Commission to take judicial notice of public reports, statistics and records so that they may be received in evidence by designation without copies or certifications.

Report on Collision at Bryan, Texas

W. P. Borland, director of the bureau of safety of the Interstate Commerce Commission, has made a report on a collision of passenger trains No. 13 and No. 16, which occurred on the Houston & Texas Central (Southern Pacific System) at Bryan, Texas, on October 4, when 46 passengers, four employees and one Pullman conductor were injured. Westbound train No. 13 ran past the switch at which it should have waited for No. 16 and, after running about one mile at low speed, and having been stopped, was run into by eastbound train No. 16, moving at from 20 to 35 miles an hour. Only two trucks in the whole of the two trains were derailed, but damage was done to both locomotives and to all of the cars in both trains.

This collision occurred at about 2:51 p. m., in clear weather, on a straight line. Train No. 13 had an order to wait at Bryan until 3:01 p. m.; but this order applied to the western end of the passing track which is some distance east of the station. The engineman continued on to the stock-pen track expecting thus to save time by having No. 16 enter another track. The collision occurred within yard limits, so that the eastbound train was also at fault. The report finds that at least five or six persons were responsible for disobedience of rules in this case, and that strict obedience by any one of these men would have prevented the collision.

Engineman McCarthy of No. 13 admitted that he should have stopped at the passing track. Conductor O'Leary of No. 13, when he saw that the train was running beyond the switch seems to have made some effort to call the engineman's attention, but the report blames him for not having applied the brakes at once. Train No. 16, according to rule, should have run within yard limits under full control. Dispatcher Rawlins is held at fault for his failure to send a copy of the wait order to the operator at Bryan, which, if it had been done, would have required the operator to stop the train at the train order signal to deliver the order. The eastbound train had run the last seven miles in about eight minutes, and entered the yard at high speed. Engineman Torrence of this train was a man of long experience and he knew also of a city ordinance limiting the speed of trains in Bryan to six miles an hour. The dispatcher had neglected to send the order to Bryan when he sent it to No. 16 because No. 16 was being delayed to get the order.

All of these various failures, says the report, "were the result of a desire to save time; a clear case of sacrificing safety for speed."

March Meeting of Signal Section

The regular meeting of the Signal Section of the American Railway Association will be held, as heretofore announced, at the Drake Hotel, Chicago, on March 8 and 9. The notice of the meeting, issued by Secretary H. S. Balliet, containing the committee reports to be presented, fills 222 pages, to which is added a supplement of 107 pages, containing reprints of papers read at regional meetings at various times within the past six years.

Automatic train control constitutes the main portion of the report of Committee 10, F. B. Wiegand, chairman. This fills 27 pages and brings the history of this subject up to date, a large amount of data having been given in the report for 1924. Notes are given here concerning what progress has been made in each of the 17 devices that were conditionally recommended by the U. S. R. A. committee in 1919. Committee 10 presents a skeleton map showing the location of each automatic train-control installation thus far completed, with dotted lines added to show territory selected for the second order, where known.

Committee 5 presents a code of instructions for testing electric locking; a code for testing mechanical locking; and a first draft, filling 17 pages, of the chapter on direct-current relays, which it is proposed to put into the handbook on signaling that it to be prepared by this committee.

The committee also presents instructions for inspecting and testing direct-current relays, filling 10 pages. Definitions of technical terms used in signaling are presented, beginning with A and running to the word "Cycle." These definitions are submitted for inclusion in the Manual and in part supersede matter now in the Manual.

Committee No. 1, B. T. Anderson, chairman, on Economics of Railway Signaling, presents (1) an abstract of a report showing the saving, on a certain railroad, not named, where automatic block signals were installed in place of the Manual block system; (2) a brief chapter on the economy of car retarders at gravity yards, and (3) a list of all the reports which have been made by this committee since its establishment in 1921.

Other committee reports to be presented at Chicago are listed in the following order: Committee VII; Committee II; Committee VI (37 designs); Committee XI (caustic soda primary cells); Committee III; Committee VIII; Committee IX.

In addition to the topics announced in the regular advance notice, Secretary Balliet has made public the following notes concerning other subjects to be brought before the meeting:

Electro-mechanical interlocking. By P. A. Rainey, Pennsylvania Railroad.

Education of employees. By L. L. Park, American Locomotive Company.

Education. By E. H. Freeman, Armour Institute of Technology.

Lighting protection for low-voltage circuits. By E. Beck, Westinghouse Electric & Manufacturing Company.

Economics of signaling. By B. J. Schwendt, New York Central.

Operation of trains by signal indication. By T. W. Cheatham, Missouri Pacific.

Report on Monmouth Junction Collision

The Interstate Commerce Commission, on February 2, issued a report, dated December 4, on the investigation made by the Bureau of Safety of the rear collision of passenger trains which occurred on the Pennsylvania Railroad near Monmouth Junction, N. J., on November 12 last, which resulted in the death of ten persons and the injury of 35.

This collision was reported in the *Railway Age* of November 21, page 946; and in the issue of December 19, page 1159, there was given an abstract of the report by the Public Utilities Commission of New Jersey. The present report gives few particulars beyond what had been made public in the earlier reports. Photographic illustrations are presented, giving two views of the cars following the collision, and one of signal No. 440 as it appears (in daylight) to a train approaching on track No. 1, that on which the collision occurred.

The assumption that Engineman Carroll, of train No. 6, must have passed signal 448 (that which indicated yellow) while he had his head inside the cab, turning on the injector, is given as that of Carroll himself. Fireman Armstrong of train No. 6 said that he saw signal 440 before Carroll did; and that Carroll then applied the air brakes; but nothing in the abstract of Armstrong's testimony explains why he was working on the fire and not watching for signal No. 448. The inspector does not accept the statements of Carroll and Armstrong that the brakes were applied immediately upon passing signal 440.

The railroad has regular examinations of enginemen for vision, color sense and hearing, and also "regular physical examinations"; and Carroll passed examinations satisfactorily in April, 1923; July, 1924; and July, 1925.

The conclusion of the report puts the responsibility on Engineman Carroll but says that "a contributing cause was the failure of Flagman Cunningham, of train No. 166, to place torpedoes on the rail as required by the rules." Had he placed torpedoes when his train was stopped at signal 440 and also when it was stopped, a little farther along, by a fusee, Engineman Carroll probably would have acted on the warning.

Engineman Carroll had begun train service as fireman in 1888. The report ends with the usual paragraph on the need of an automatic train control device.

New York Grade Crossing Law

A grade crossing elimination act, designed to regulate the expenditure of state funds, as provided for in the recent constitutional amendment, authorizing the issuance of state bonds to the amount of \$300,000,000 for eliminating grade crossings of railroads and highways, was introduced in the legislature at Albany

on February 1. The bill was presented by Senator Charles J. Hewitt, chairman of a joint special committee. The bill is so worded as not to affect the cities of New York, Buffalo and Syracuse where plans of procedure have already been provided, under earlier legislation; although these cities will have the same claim on the state funds, as contemplated by the constitutional amendment, as do the other cities and towns of the state.

The bill places primary responsibility on the Public Service Commission, which is to designate crossings to be eliminated and specify the manner in which such elimination shall be carried out. The order of the commission goes to the state Department of Public Works, which department is to supervise the work; but the bill contemplates the division of the actual work between the railroad and the state; the railroad to build within its own lines and the state outside of those lines. The cost is to be apportioned, as under existing laws, one-quarter to the state, one-quarter to the town or city and one-half to the railroad.

To guard against putting undue burdens on towns the bill provides that no elimination shall be ordered in a municipality where the repayments to the state for all eliminations therein to be made in any year shall exceed one-twentieth of one per centum of the assessed valuation of the taxable property within such municipality, unless such municipality pass a resolution or ordinance praying for such elimination regardless of the excess cost. Further to relieve tax-burdened towns there is a provision under which counties, by action of their Board of Supervisors, may provide aid to a city, town or village.

The proceeds of state bonds are to be used to pay the entire expense of any elimination (unless a railroad or municipality shall prefer to pay direct) and then, after the work is completed, the state controller, following a hearing, is to determine how and when the railroad and the town shall repay to the state what has been advanced. Provision is made for enforcing this debt against the railroad or the municipality.

The bill repeals the present statute having reference to the removal of crossings. Chairman Hewitt expects that the annual expenditure will be \$10,000,000 up-state and that a similar amount will be set aside for the City of New York if needed.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 165 Broadway, New York City. Next convention, May 4-7, 1926, New Orleans, La. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—John B. Wright, Westinghouse Air Brake Co., Pittsburgh, Pa. Meeting with Air Brake Association.

AMERICAN ASSOCIATION OF ENGINEERS.—H. Almert, 63 E. Adams St., Chicago. Next convention, June, 1926, Philadelphia, Pa.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—Grant Williams, 1341 Railway Exchange, Chicago.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 St. Michigan Ave., Chicago. Next meeting, June 1, 1926, Atlantic City, N. J.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Next convention, June 15-18, 1926, Montreal, Quebec, Canada.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—T. E. Welsh, Chicago, North Shore & Milwaukee, Highland, Ill. Next convention, 1926, Baltimore, Md.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—J. W. Welsh, 292 Madison Ave., New York. Annual convention, October, 1926.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—C. Borchardt, 202 North Hamilton Ave., Chicago, Ill.

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.

Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York. Freight Station Section (including former activities of American Association of Freight Agents).—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, April 20, 1926, Dallas, Tex.

Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association).—J. C. Caviston, 30 Vesey St., New York, N. Y. Annual meeting, June 23-24, 1926, Mount Royal Hotel, Montreal, Canada.

Safety Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, April 27-29, 1926, Hotel Statler, St. Louis, Mo.

Telegraph and Telephone Section (including former activities of the Association of Railroad Telegraph Superintendents).—W. A. Fairbanks, 30 Vesey St., New York. Next meeting, Sept. 21-23, 1926, Swampscott, Mass.

Division II.—Transportation (including former activities of the Association of Transportation and Car Accounting Officers).—G. W. Covert, 431 South Dearborn St., Chicago, Ill. Next meeting, April, 1926.

Division III.—Traffic, J. Gottschalk, 143 Liberty St., New York.

Division IV.—Engineering, E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Annual convention, March 9-11, Congress Hotel,

- Chicago. Exhibit by National Railway Appliances Association, at Coliseum, March 8-11.
- Construction and Maintenance Section.—E. H. Fritch.
- Electric Section.—E. H. Fritch.
- Signal Section (including former activities of the Railway Signal Association).—H. S. Balliet, 30 Vesey St., New York, N. Y. Next meeting, March 8-9, 1926, Drake Hotel, Chicago.
- Division V.—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Annual convention, June 9-16, Atlantic City, N. J. Exhibit by Railway Supply Manufacturers' Association.
- Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Next meeting, September 21-23, 1926.
- Division VI.—Purchases and Stores (including former activities of the Railway Storekeepers' Association).—W. J. Farrell, 30 Vesey St., New York, N. Y. Next meeting, June 9-11, 1926, Vernon Room, Haddon Hall Hotel, Atlantic City, N. J.
- Division VII.—Freight Claims (including former activities of the Freight Claim Association).—Lewis Pilcher, 431 South Dearborn St., Chicago, Ill.
- Car Service Division.—C. A. Buch, 17th and H Sts., N. W., Washington, D. C.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Annual convention, October, 1926, Richmond, Va. Exhibit by Bridge and Building Supply Men's Association.
- AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—H. W. Byerly, General Immigration Agent, Northern Pacific, St. Paul, Minn. Annual meeting, June 23-25, 1926, Vancouver, B. C.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railway Association Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Annual convention, March 9-11, Congress Hotel, Chicago. Exhibit by National Railway Appliances Association, at Coliseum.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railway Association, Division V.)
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C. M. & St. P. Ry., 11402 Calumet Ave., Chicago. Annual convention, September 1-3, 1926, Hotel Sherman, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.
- AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittlesey, 1319-21 F St., N. W., Washington, D. C.
- AMERICAN SOCIETY FOR STEEL TREATING.—W. H. Eisenman, 4600 Prospect Ave., Cleveland, Ohio.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, 1315 Spruce St., Philadelphia, Pa. Annual meeting, Atlantic City, June 21-25, 1926.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—29 W. 39th St., New York. Regular meetings 1st and 3rd Wednesday in month, except July and August, 33 W. 39th St., New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Marion B. Richardson, Associate Mechanical Editor, *Railway Age*, 30 Church St., New York.
- AMERICAN TRAIN DISPATCHERS' ASSOCIATION.—C. L. Darling, 10 East Huron St., Chicago, Ill. Biennial convention, July 18, 1927.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—E. J. Stocking, 111 West Washington St., Chicago.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Annual meeting, May 18-20, 1926, Los Angeles, Calif.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Annual meeting, October 27-30, 1926, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.
- ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, 17th & H Sts., N. W., Washington, D. C.
- ASSOCIATION OF RAILWAY SUPPLY MEN.—S. A. Witt, Detroit Lubricator Co., Chicago. Meeting with International Railway General Foremen's Association.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railway Association, Division I.)
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railway Association, Division II.)
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Fred M. Condit, Fairbanks, Morse & Co., Chicago. Meeting with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.—C. R. Crook, 129 Charron St., Montreal, Que.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2nd Monday in month, except June, July and August, Great Northern Hotel, Chicago.
- CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, 514 East Eighth St., Los Angeles, Calif. Regular meetings, second Friday of each month, 514 East Eighth St., Los Angeles.
- CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—R. E. Giger, 721 North 23rd St., East St. Louis, Ill. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.
- CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.
- CHICAGO CLAIM CONFERENCE. Personal Injury Section.—F. L. Johnson, Chicago & Alton R. R., 340 Harrison St., Chicago. Meets 12:30 p. m., first Monday each month, Sherman Hotel, Chicago.
- CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—A. S. Sternberg, Belt Ry. of Chicago, Polk and Dearborn Sts., Chicago.
- CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—Bradley S. Johnson, W. H. Miner, Rookery Bldg., Chicago, Ill. Meeting with Chief Interchange Car Inspectors' and Car Foremen's Association.
- CINCINNATI RAILROAD CLUB.—W. C. Cooder, Union Central Bldg., Cincinnati, Ohio. Meetings, 2nd Tuesday in February, May, September and November.
- CLEVELAND STEAM RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings, first Monday each month, Hotel Cleveland, Public Square, Cleveland.
- EASTERN RAILROAD ASSOCIATION.—E. N. Bessling, 614 F St., N. W., Washington, D. C. Annual meeting, May 13, 1926, Railroad Club, New York.
- FREIGHT CLAIM ASSOCIATION.—(See American Railway Association, Division VII.)
- INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Next convention, August 17-19, 1926, Hotel Winton, Cleveland, O. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.
- INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—Edwin T. Jackman, 710 W. Lake St., Chicago.
- INTERNATIONAL RAILWAY CONGRESS.—Office of Permanent Commission of the Association, 74 rue du Progrès, Brussels, Belgium. General secretary, P. Ghilain. Next session of the Congress, Spain, 1926.
- INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. B. Hutchison, 1809 Capitol Ave., Omaha, Neb. Annual convention, May 11-14, 1926, Hotel Sherman, Chicago. Exhibit by International Railway Supply Men's Association.
- INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha Ave., Winona, Minn.
- INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—F. P. Roesch, 1942 McCormick Bldg., Chicago. Earl E. Thulin, assistant secretary, 715 Peoples Gas Bldg., Chicago. Meeting with International Railway Fuel Association.
- MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York. Next meeting, May 25-28, 1926, Hotel Statler, Buffalo.
- MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Div. V.)
- MASTER CAR BUILDERS' ASSOCIATION.—(See A. R. A., Division V.)
- MOBILE TRAFFIC & TRANSPORTATION CLUB.—T. C. Schley, 71 Conti St., Mobile, Ala. Regular dinner meetings, 6 p. m., on 2nd Thursday of each month, Cawthon Vineyard, Mobile, Ala.
- NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—J. S. Penney, T. J. Moss Tie Company, 720 Security Bldg., St. Louis, Mo.
- NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Annual convention, November 9, 1926, Asheville, N. C.
- NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York. Annual convention, April 28-30, 1926, Charleston, S. C.
- NATIONAL HIGHWAY TRAFFIC ASSOCIATION.—Elmer Thompson, 12 East 53rd St., New York.
- NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 845 South Wabash Ave., Chicago. Annual exhibition, March 8-11, Coliseum, Chicago, at convention of American Railway Engineering Association.
- NATIONAL SAFETY COUNCIL.—Steam Railroad Section: E. R. Cott, Safety Agent, Hocking Valley Ry., Columbus, Ohio.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2nd Tuesday in month, excepting June, July, August and September, Copley-Plaza Hotel, Boston, Mass.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3rd Friday in month, except June, July and August.
- PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.
- PURCHASES AND STORES DIVISION.—(See American Railway Association, Division VI.)
- RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C. Next annual convention, June 8-11, 1926, Chateau Frontenac, Quebec, Canada.
- RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 600 Liberty Bldg., Broad and Chestnut Sts., Philadelphia, Pa.
- RAILWAY CAR MANUFACTURERS' ASSOCIATION.—W. C. Tabbert, 61 Broadway, New York.
- RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.
- RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)
- RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Annual meeting with Association of Railway Electrical Engineers.
- RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—Joseph Sinkler, Pilot Packing Co., Peoples Gas Bldg., Chicago. Meeting with Traveling Engineers' Association.
- RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md. Annual meeting, October 12, 1926.
- RAILWAY REAL ESTATE ASSOCIATION.—C. C. Marlor, Room 1243, Transportation Building, Chicago.
- RAILWAY SIGNAL ASSOCIATION.—(See A. R. A., Division IV., Signal Section.)
- RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A., Division VI.)
- RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division, A. R. A., June 9-16, Atlantic City, N. J.
- RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A., Division I.
- RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supv. Road, Baltimore & Ohio, Pittsburgh, Pa. Next convention, September 21-23, 1926, Chicago. Exhibit by Track Supply Association.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2nd Friday in month, except June, July and August.
- SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section, March 8-9, 1926.
- SOUTHEASTERN CARMEN'S INTERCHANGE ASSOCIATION.—J. E. Rubley, Southern Railway Shop, Atlanta, Ga. Meets semi-annually.
- SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.
- SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. L. Carrier, Car Serv. Agent, Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn.
- SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—W. R. Mau, Vanadium Alloys Steel Co., Latrobe, Pa.
- TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo-Ajax Corporation, Hillburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association.
- TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Annual meeting, September 14-17, 1926, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.
- WESTERN RAILWAY CLUB.—Bruce V. Crandall, 226 West Jackson Boulevard, Room 1001, Chicago. Regular meetings, 3rd Monday each month, except June, July and August.
- WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, 1735 Monadnock Block, Chicago, Ill.

Traffic News

A bill to permit common carriers to give free carriage or reduced rates to the Board of Railway Commissioners for Canada has been introduced in the Senate at Washington by Senator Couzens.

The number of passengers passing through the two large stations in Boston, the North station and the South station in 1925 was about 4,000,000 less than in the preceding year; a loss of 1,745,417 (6.29 per cent) at the North station and a loss of 2,165,423 at the South station.

Bill to Favor Coal as Grain Is Favored in Canada

A private bill calling for an amendment to the Railway Act of 1919 to provide for special low rates on coal was introduced in the Canadian House of Commons last week by Thomas L. Church, one of the Conservative members from Toronto. In explaining the purpose of his bill Mr. Church said: "The object of this bill is to provide a remedy for the existing problem of supplying coal in Canada, and of rendering Canada independent of foreign supply. The bill is an effort to establish a national policy for the carriage of Canadian coal and coke on the same basis as is provided by the special tariff on grain and flour."

Warning his audience that if they considered the remedy for the coal or the grain question to lie in a reduction of freight rates they were opening the door to "almost chaotic consequences," Sir Henry Thornton, president of the Canadian National, addressing the Canadian Club of Toronto this week, outlined some of the problems now confronting the road.

"I do not think," he said, "that the Canadian National should be called upon to correct all the economic ills of the country, but if the people feel that the Canadian National should be called upon to reduce its freight rates to cure those ills, it would relieve me of the anxiety as to the result of its net earnings. The property is yours and with you must rest the decision."

New Haven Motor Coach Timetable

The New England Transportation Company, the bus subsidiary of the New York, New Haven & Hartford, has issued its first complete timetable, giving schedules on 31 routes, six of which are operated by affiliated companies. The table is issued in the form of an 8-page folder, following closely the style of the usual railroad public timetable.

Following is a list of the routes with distances and rates of fare:

	Miles	Fare
1 Providence to Worcester.....	42.6	\$1.60
2 Providence to Bristol.....	16.5	.40
3 Worcester to Fitchburg.....	25.4	.95
4 Providence to Willimantic.....	46.5	2.00
5 Providence to Norwich.....	55.8	1.85
6 Woonsocket to Willimantic.....	34.5	1.85
7 Norwich to New London.....	13.4	.50
8 Norwich to Willimantic.....	17.6	.60
9 South Braintree to North Easton.....	14.0	.45
10 Whitman to Bridgewater.....	6.8	.27
11 North Easton to Brockton.....	15.7	.52
12 Brockton to New Bedford.....	36.6	1.30
13 Taunton to Fall River.....	16.6	.55
14 New Haven to Hartford.....	37.6	1.35
15 New Haven to Easthampton (Conn.).....	35.6	1.20
16 New Haven to Easthampton (Mass.).....	72.8	2.60
17 Danbury to New Haven.....	41.1	1.40
18 Danbury to Canaan.....	59.7	1.86
19 Danbury to South Norwalk.....	24.2	.90
20 Hartford to Westfield.....	31.1	1.50
21 Hartford to Broad Brook.....	15.8	.55
22 Hartford to Suffield.....	21.4	.60
23 North Easton to Canton Junction.....	9.8	.30
24 River Point to Hope.....	2.9	.11
25 Wickford to Wickford Junction.....	3.0	.10
26 Ridgefield to Branchville.....	4.4	.20

*Mid-State Stage Co.

Affiliated Motor Coach Companies

	Estimated Miles† Fare	
Providence to Fall River.....	17	\$1.60 (Interstate Ltd. Motor Coach Co.)
Providence to New Bedford.....	12.2	1.00 (Union St. Railway)
Providence to Newport.....	25.6	1.20 (Colonial Coach Co.)
Providence to Plainville.....	13.6	.44 (Interstate St. Ry.)
Hull to Hingham.....	3.5	..... (Nantasket Transportation Co.)

†Not shown in time table.

Commission and Court News

Interstate Commerce Commission

The commission has denied the petition of the American Newspaper Publishers' Association for leave to intervene in the railway mail pay case in which the railways have applied for higher rates.

Fourth Section Applications Granted in Part

The Interstate Commerce Commission has rendered its decision on fourth section applications Nos. 1860, 1862, 3024 and portions of fourth section applications Nos. 1842 and 4220, involving freight rates between Western Trunk Line territory and points west of the Missouri river.

The Chicago, Milwaukee & St. Paul and Illinois Central and connecting lines were authorized to continue to maintain class and commodity rates from, to, or between St. Louis, Mo., Peoria and Chicago, Ill., and points taking the same rates, on the one hand, and points in Missouri, Kansas, Nebraska, and Colorado, on the other, lower than at intermediate points as defined in the report.

The St. Louis-San Francisco and connecting lines were authorized to continue to maintain class and commodity rates from, to, or between St. Louis, Mo., Peoria and Chicago, Ill., and points taking the same rates, on the one hand, and Kansas City, Mo., and points on its line south and southeast thereof on the other, lower than at intermediate points in Missouri and Kansas.

The Union Pacific, Chicago, Rock Island & Pacific and connecting lines were authorized to continue to maintain class and commodity rates from, to, or between St. Louis, Mo., Peoria and Chicago, Ill., St. Paul and Minneapolis, Minn., points taking the same rates, and points basing thereon, on the one hand, and certain points in Nebraska and Kansas on the other, lower than at intermediate points in Nebraska and Kansas.

The Atchison, Topeka & Santa Fe and connecting lines were authorized to continue to maintain class and commodity rates, and the Missouri, Kansas & Texas was authorized to continue to maintain class rates from, to, or between St. Louis, Mo., Peoria and Chicago, Ill., St. Paul and Minneapolis, Minn., points taking the same rates, and points basing thereon, on the one hand, and certain points in Kansas and Missouri, on the other, lower than at intermediate points in Kansas.

The Missouri Pacific and connecting lines were authorized to continue to maintain class rates from, to, or between St. Louis, Mo., Peoria and Chicago, Ill., St. Paul and Minneapolis, Minn., points taking the same rates, and points basing thereon on the one hand, and Aurora and Springfield, Mo., on the other, lower than at intermediate points in Missouri.

The Kansas City Southern and connecting lines were authorized to continue to maintain class and commodity rates from, to, or between St. Louis, Mo., Peoria and Chicago, Ill., and points taking the same rates on the one hand, and points north of Eve and Gulfport, Mo., in connection with the St. Louis-San Francisco, lower than at intermediate points in Missouri.

Disposition of those portions of the applications which cover fourth-section departures in commodity rates at points on Missouri, Kansas & Texas and Missouri Pacific was deferred.

Except as fourth-section relief has heretofore been authorized by permanent orders of the commission and as herein authorized, all other and further relief prayed by the applications or portions thereof herein considered were denied.

Personnel of Commissions

A. Stuard Young, formerly attorney-examiner and chief of the section of securities, Bureau of Finance, Interstate Commerce Commission, has become associated with Stimson, Dorr & Bronson in the general practice of law at Washington, D. C.

The Senate committee on interstate commerce expected to hold a meeting on February 3 to vote on the question of recommending to the Senate the confirmation of the appointment of Thomas F. Woodlock as a member of the Interstate Commerce Commission, but the meeting was postponed.

Equipment and Supplies

Locomotives

THE CHICAGO, INDIANAPOLIS & LOUISVILLE is inquiring for 6 Mikado type locomotives.

THE SIMPSON LOGGING COMPANY has ordered one 2-6-6-2 Mallet type locomotive from the Baldwin Locomotive Works.

THE ALTON & SOUTHERN has ordered one Mikado type locomotive from the American Locomotive Company. This locomotive will have 25-in. by 30-in. cylinders and have a total weight in working order of 275,000 lb.

THE BIRMINGHAM & SOUTH-EASTERN has ordered one Consolidation type locomotive from the American Locomotive Company. This locomotive will have 19-in. by 26-in. cylinders and a total weight in working order of 138,000 lb.

THE WEIRTON STEEL COMPANY has ordered one eight-wheel switching locomotive from the American Locomotive Company. This locomotive will have 25-in. by 30-in. cylinders and a total weight in working order of 236,000 lb.

THE BWANA M'KUBWA COPPER COMPANY, Rhodesia, South Africa, has ordered one Prairie type locomotive from the American Locomotive Company. This locomotive will have 16-in. by 20-in. cylinders and a total weight in working order of 111,000 lb.

Freight Cars

THE WESTERN MARYLAND is inquiring for 1,000 box cars of 40 tons' capacity.

THE CANADIAN PACIFIC has ordered 100 all steel cars of 80-tons' capacity for carrying ore. The order was given to the Canadian Car & Foundry Co.

THE HAINESPORT MINING & TRANSPORTATION COMPANY has ordered 8 steel hopper cars of 50 tons' capacity from the American Car & Foundry Company.

THE PREMIER EQUIPMENT CORPORATION, Inc., Houston, Texas, is inquiring for 50 tank cars of 8,000-gal. capacity and 50 tank cars of 10,000-gal. capacity.

THE ST. LOUIS-SAN FRANCISCO will construct 950 steel underframes in its shops at Memphis, Tenn., and will make repairs to 350 gondola cars and 600 box cars.

THE CHICAGO & EASTERN ILLINOIS has renewed its inquiry for 500 hopper cars of 70 tons' capacity. A previous inquiry for this equipment was reported in the *Railway Age* of December 12.

Pacific Fruit Express Orders 5,043 Refrigerator Cars

The Pacific Fruit Express has ordered 5,043 refrigerator cars from the following builders: American Car & Foundry Company, 1,000; General American Car Company, 1,000; Pacific Car & Foundry Co., 1,000; Standard Steel Car Company, 1,000, and Pullman Car & Manufacturing Corporation, 1,043. Inquiry for this equipment was reported in the *Railway Age* of December 26.

Passenger Cars

THE MISSOURI PACIFIC has ordered three combination passenger and baggage gasoline rail motor cars from the J. G. Brill Company.

THE DELAWARE, LACKAWANNA & WESTERN has ordered two dining cars from the Pullman Car & Manufacturing Corporation. Inquiry for this equipment was reported in the *Railway Age* of November 21.

THE FLORIDA EAST COAST has ordered 8 baggage cars, 2 mail cars and 2 dining cars from the Pullman Car & Manufacturing Corporation. This company has bought 15 converted coaches from the Pullman Company.

THE CENTRAL OF NEW JERSEY has ordered 25 coaches from the Bethlehem Shipbuilding Corporation, 5 combination passenger and baggage cars from the Pressed Steel Car Company and 5 baggage express cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of January 16.

Iron and Steel

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 123 tons of structural steel for use at Victor, Iowa, from the American Bridge Company.

MITSUI & COMPANY, New York, have ordered 5,300 tons of 80-lb. rail from the United States Steel Products Company. This rail is for export to China.

THE NEW YORK CENTRAL has ordered 175 tons of steel for bridges, from the American Bridge Company, and 3,100 tons of steel from the Mount Vernon Bridge Company.

THE WABASH has ordered 520,000 tie plates from the Illinois Steel Company, 280,000 from the Inland Steel Company, 100,000 from the Scullin Steel Company, and 100,000 from the Interstate Iron & Steel Co.

Machinery and Tools

THE CHICAGO & NORTH WESTERN is inquiring for 27 machine tools.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for one pile driver.

THE BALTIMORE & OHIO has ordered a 58-in. locomotive rod milling machine from the Niles-Bement-Pond Company.

THE CLEVELAND, CHICAGO, CINCINNATI & ST. LOUIS has ordered a Monarch helical gear lathe from Manning, Maxwell & Moore, Inc.

THE LOUISVILLE, HENDERSON & ST. LOUIS has ordered a hydro pneumatic straightening and forcing press from Manning, Maxwell & Moore, Inc.

THE FLORIDA EAST COAST is inquiring through Battey & Kipp, engineers, Chicago, for a number of tools for its shops at St. Augustine, Fla.

THE PENNSYLVANIA CAR COMPANY has ordered an axle lathe, a car wheel borer and a 400-ton wheel press from the Niles-Bement-Pond Company.

Signaling

THE NORTHERN PACIFIC has authorized the installation of automatic train control between Dickinson, N. D., and Glendive, Mont.; estimated cost, \$95,000.

THE CHICAGO & ALTON has placed an order with the National Safety Appliance Company for automatic train control apparatus to be installed between Pontiac, Ill., and Chenoa, 10 miles.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS is to install automatic color-light block signals between Nashville, Tenn., and Cowan, 87 miles, by the company forces, at an estimated cost of \$287,464.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has authorized the installation of automatic signals between Marion, Ohio, and Bellefontaine, a distance of 39 miles, at an estimated cost of \$130,000.

THE WESTERN OF ALABAMA has ordered from the Union Switch & Signal Company material for automatic block signals, semaphores, type S, for its line between Milstead, Ala., and Montgomery, 27 miles, single track. With this installation finished, a complete automatic block signal system, all Union signals, will be in service over the Atlanta & West Point and the Western of Alabama from Atlanta, Ga., to Montgomery, Ala., 175 miles.

Supply Trade News

H. S. Durant has been appointed manager of the cold rolled strip and spring sales department of the **American Steel & Wire Company**, Chicago.

James H. Enochs, representative of the **Harnischfeger Sales Corporation**, Milwaukee, Wis., has been appointed manager of the new branch established at Indianapolis, Ind.

H. S. Shields, for 30 years a representative of the **Flood & Conklin Company**, Newark, N. J., has resigned to become representative of the **Williams-Hayward Company**, Chicago.

The **Sidney B. Roby Company**, 203 South avenue, Rochester, N. Y., will in future represent exclusively in Monroe county, N. Y., **The Geometric Tool Company**, New Haven, Conn.

The **Braeburn Alloy Steel Corporation** has opened a general sales office in the National Bank building, Pittsburgh, Pa., under the direction of **H. Oliver Williams**, vice-president in charge of sales.

W. G. Willcoxson, formerly representative of **Milar Clinch & Co.**, Chicago, has been appointed representative of the **Boss Bolt and Nut Works** division of the **Hoopers and Townsend Corporation**, with headquarters in Chicago.

George Bartol, treasurer of the **Otis Steel Company**, Cleveland, Ohio, has been elected vice-president and will be succeeded by **L. Kemper**, vice-president of the **Midland Steel Products Company**, an affiliated company.

Benjamin F. Brown, vice-president of the **Otley Paint Company**, and **Marcus G. Lindsay**, secretary, have resigned to organize the **Brown-Lindsay Paint Company**, which will manufacture structural, industrial and railway paints, 1420 Center street, Chicago.

Fred M. Egolf, formerly with the **Haskellite Manufacturing Company**, Chicago, has been appointed railway representative of the **Timken-Detroit Axle Company**, Detroit, Mich. He will cover the eastern territory and will have headquarters at 2 Rector street, New York.

C. M. Bogert has been appointed district manager of the **Diamond State Fiber Company**, Bridgeport, Pa., for the state of Connecticut, with office at South Norwalk, Conn. **W. R. Elsenhens**, formerly of the Bridgeport office staff, has been appointed district manager at Philadelphia, with office at 822 Drexel building.

Charles C. Castle, vice-president at New York, has resigned from the **National Railway Appliance Company**, the **Hageman-Castle Corporation**, **Anglo-American Varnish Company** and **The Genesco Corporation**, and on April 1 will be associated with the **American Car & Foundry Motors Company** with headquarters at New York.

The **Dreses Machine Tool Company**, Cincinnati, Ohio, has given a contract for an entirely new plant to cost \$100,000. The **Austin Company**, Cleveland, is the engineer and builder. The new plant will be of one-story design, 90 ft. by 300 ft., with monitor. About 100 tons of structural steel will be required. Cranes will be installed, two 5-ton cranes in the center aisle and one 3-ton crane in the side aisle. The **Austin Company** contract includes heating, lighting, plumbing and erection of cranes in addition to construction.

The **Graybar Electric Company**, New York, formerly the supply department of the **Western Electric Company**, has made several changes in the organization of its department staffs as follows: **W. O. Ramsburg**, general service manager, now

reports to the vice-president in charge of staff; **G. E. Chase** is broadcasting sales manager; **A. J. Eaves** is carrier telephone sales manager; and **R. M. Hatfield** is public address sales manager. **C. E. Reddig** has been appointed appliance engineer of the company and will report direct to the manager of the telephone and appliance department. **W. A. Fouhy** is the new plant engineer.

Warren Roberts, president of the **Roberts & Schaefer Company**, Chicago, has been elected chairman of the board, a newly created office, and will be succeeded by **Edward E. Barrett**, vice-president. **Frank E. Mueller**, second vice-president, has been promoted to first vice-president. **Clyde P. Ross**, third vice-president, has been promoted to second vice-president. **Ray W. Arms**, manager of the coal cleaning department, has been promoted to third vice-president.

LeGrand Parish has retired as president of the **American Arch Company**, New York, and has been succeeded by **H. B. Slaybaugh**, who has been executive vice-president of the company and has been associated with Mr. Parish throughout the life of the company. **George A. Price**, treasurer, has been made secretary and treasurer; **F. B. Johnson** has been made assistant secretary, and **H. W. Muller** has been made assistant treasurer, all with headquarters at New York.



H. B. Slaybaugh

G. E. Brown, general foreman electrician of the **Northern Pacific**, has resigned to go with the **Westinghouse Electric & Manufacturing Company**, as salesman in the transportation department, with headquarters at 2303 North East Kennedy street, Minneapolis, Minn. Mr. Brown succeeded **R. F. Castner**, who has been appointed manager of the Westinghouse branch at Des Moines, Iowa.

T. W. Barry, estimating engineer of the **Louisville Frog & Switch Company**, Louisville, Ky., has been promoted to chief engineer. He was born in Louisville, Ky., and after graduating from St. Xavier's College, entered the engineering department of the **Pennsylvania**. On July 31, 1922, he was appointed cost engineer of the **Louisville Frog & Switch Company**, and later became shop supervisor of the crossing section. In January, 1924, he became a draftsman and later was appointed estimating engineer, which position he has held until his recent promotion.

R. H. Dougherty, who has been in charge of the sheet division of the **United Alloy Steel Corporation**, Canton, Ohio, has been promoted to assistant general manager. He entered the employ of the **American Steel Hoop Company** in 1899 and upon its absorption by the **U. S. Steel Corporation** became associated with the **Carnegie Steel Company**. In 1919 he entered the employ of the **United Alloy Steel Corporation** and held the position of production manager until May, 1925, at which time he was placed in charge of the sheet division including the **Berger factory**.

The **American Brown Boveri Electric Corporation** has acquired two additional properties, namely the **Railway & Industrial Engineering Company** of Greensburg, Penn., and the **Electric Development & Machine Co.** of Holmesburg, Penn., near Philadelphia. These latest acquisitions will considerably amplify the present line of **American Brown Boveri** electric products. In addition to the newly acquired properties, the corporation also has in operation its plants at Camden, as well

as those of the Condit Electric Manufacturing Company, Boston, the Scintilla Magneto Co., Sidney, N. Y., and the Maloney Electric Company, St. Louis. The newly acquired companies specialize in high tension switching and protective equipment for power companies. They will be operated as distinct units in the American Brown Boveri group and their production will supplement that of the other units of the corporation.

James Aston of Pittsburgh, Pa., for the past five years metallurgical engineer in charge of research with the A. M. Byers Company, has been appointed professor of mining and metallurgy and head of the department of mining and metallurgical engineering of Carnegie Institute of Technology. The appointment became effective February 1, and fills the vacancy caused by the death last February of Professor Fred Crabtree. Professor F. F. McIntosh, who has been in charge of the department as acting head since Mr. Crabtree's death, has resigned to take an important position with the Crucible Steel Company.

At a meeting of the board of directors of the J. G. Brill Company on January 29, W. H. Woodin, president of the American Car & Foundry Company, was elected a director to fill the unexpired term of William H. Heulings, Jr., deceased. At the organization meeting of the Brill Corporation, a Delaware corporation, held in New York City, on January 30, the following directors were elected: Samuel M. Curwen, William M. Hager, Francis A. Lewis, William Clarke Mason, E. P. Rawle, C. S. Sale, G. R. Scanland and W. H. Woodin, and the directors elected the following officers: W. H. Woodin, chairman of the board; Samuel M. Curwen, president; G. R. Scanland, vice-president; H. C. Wick, secretary and S. A. Mallette, treasurer.

F. H. Moyer, assistant to the vice-president in charge of operations of the United Alloy Steel Corporation, Canton, Ohio, has been promoted to general superintendent of operations. He graduated from Cornell University in 1899, and until December, 1920, was associated with the Carnegie Steel Company, the Indiana Steel Company and the Cambria Steel Company in engineering capacities. On the latter date he was appointed assistant to the works manager of the Pittsburgh Crucible Steel Company, Midland, Pa., and in January, 1923, he entered the employ of the United Alloy Steel Corporation as chief engineer. On January 1, 1925, he was appointed assistant to the vice-president in charge of operations, which position he has held until his recent promotion.

The interests of the Columbia Steel Company, Elyria, Ohio, and the Forged Steel Wheel Company, Pittsburgh, Pa., have been combined. Sufficient finishing equipment to assure control over every operation entering into the production of hot and cold rolled strip steel will be installed. The Columbia Steel Company started operation in 1898 and for years manufactured high grade cold rolled strip steel. The manufacture of forged steel wheels, for railroad equipment, the principal product of the Forged Steel Wheel Company, will be continued at the Butler plant, and the manufacture and selling of this product will be handled by the same organization as in the past. The plant of the Forged Steel Wheel Company was first operated in 1912. The products consisted of forged wheels, billets, slabs, plates and bars.

Obituary

D. B. Wright, formerly manager of the railroad department of the B. F. Nelson Manufacturing Company, Minneapolis, Minn., with headquarters in Chicago, and previously sales manager of the Lehon Company, died on January 30 in Chicago as the result of a stroke.

Carter Miller, advertising manager of the Timken Roller Bearing Company, Canton, Ohio, died on January 11 after a brief illness. Mr. Miller entered the service of The Timken Company six years ago and was promoted rapidly to various positions both in the field and at the home office, until he was given charge of the advertising department.

Railway Construction

CANADIAN NATIONAL.—A contract has been awarded to Pacific Engineers, Ltd., Vancouver, B. C., for the construction of two slips, one at Ogden Point and the other at Point Ellice, Victoria, B. C., to be used in the handling of lumber for export.

CENTRAL OF GEORGIA.—This company has awarded a contract to Joseph E. Nelson & Sons, Chicago, for the construction of a round-house and storehouse at Albany, Ga., to cost approximately \$100,000.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—Bids will be requested about April 1 for the construction of a passenger station at Bedford, Ind., to cost \$50,000.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—A contract has been awarded to the Walsh Construction Company, Davenport, Ia., for the construction of a second main track and relocation of the line from Bellefontaine, Ohio, to West Liberty, 8 miles, at a cost of \$1,700,000. The joint contract has been awarded to the M. E. White Company and the Walsh Construction Company for the construction of a second main track and grade revision between West Liberty and Glenecho, Ohio, 18 miles, at a cost of \$1,760,000. The following construction projects have been authorized: engine terminal at Kankakee, Ill., to cost \$264,000; second track in Columbus, Ohio, to cost \$66,000; bridge No. 282 at Cardington, Ohio, to cost \$65,000, and a grade separation at Lima Road, Huntsville, Ohio, to cost \$90,000. A contract has been awarded to the Bethlehem Steel Company for a turntable to be installed at Hillsboro, Ill.

COLORADO & SOUTHERN.—A passenger station will be constructed this year at Trinidad, Colo., at a cost of \$75,000. Construction—Ry. Age—Emery—2 1 26.

DENVER & RIO GRANDE WESTERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line of 6.28 miles from Spring Canyon Junction, Utah.

NORTHERN PACIFIC.—The following construction projects have been authorized: A bridge over city waterway at Tacoma, Wash., to cost \$90,000; bridge on the Rocky Mountain division, to cost \$50,000; grade separation at Minneapolis, Minn., to cost \$250,000; under crossings at Coon Creek, Minn., and Billings, Mont., to cost \$42,000 and \$75,000, respectively; boiler washing plant at Livingston, Mont., to cost \$40,000; passenger station at Wapato, Wash., to cost \$50,000, and a water-treating plant at Mandan, N. D., to cost \$25,000.

SOUTHERN PACIFIC.—A contract for all concrete work in connection with the construction of tunnels on the Natron cut-off from Oakridge, Ore., to Kirk, has been awarded to the Utah Construction Company, San Francisco, Cal.

STATE DOCKS COMMISSION OF ALABAMA.—The commission has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a terminal railroad of 5.69 miles, with 27 miles of switch tracks and 5 miles of industrial tracks, serving the docks at Mobile, Ala.

UNION RAILROAD.—A contract has been awarded to the Roberts & Schaefer Co., Chicago, for the construction of a reinforced concrete, automatic electric coaling and sanding station and an electric cinder plant at Hall, Pa., to cost approximately \$30,000.

WABASH.—An agreement has been reached with the city of St. Louis, Mo., under which the grade crossing at Delmar boulevard will be eliminated by the construction of a viaduct over the railway's tracks. The construction of the viaduct will be undertaken jointly by the Wabash and the city. It will be of reinforced concrete construction and will cost approximately \$625,000, of which the Wabash will pay 60 per cent. It is proposed that the Wabash erect also a new passenger station at Delmar boulevard to conform with the architecture of the bridge.

WICHITA FALLS & SOUTHERN.—Bids have been received for the construction of a two-story brick and concrete freight station at Wichita Falls, Tex., to cost approximately \$75,000.

Railway Financial News

ATCHISON, TOPEKA & SANTA FE.—Stockholders to Vote on Stock Issue.—At the annual meeting on April 22, stockholders will vote upon a resolution amending the by-laws as follows:

"The board of directors in the exercise of such power of management may from time to time cause to be issued and may dispose of any capital stock of the company, common or preferred, heretofore or hereafter authorized, in such manner and upon such terms and in all respects as the board shall deem advisable, subject, however, to such preferential rights as the then existing stockholders may have to subscribe therefor."

The Santa Fe, which is incorporated under the laws of Kansas, has authorized but unissued common stock totaling \$117,537,000 par value, of which \$17,248,000 has heretofore been offered to stockholders and not subscribed for. The Kansas statutes provide the directors may dispose of the residue of the capital stock at any time remaining unsubscribed, in such manner as the by-laws may prescribe. The \$17,248,000 of capital stock above mentioned is a residue unsubscribed under the Kansas statutes. The existing by-laws do not prescribe the manner in which the directors may dispose of such unsubscribed stock. In order to make the by-laws conform to the requirements of the Kansas statutes, provide a comprehensive plan for the issuance and disposition of shares of capital stock, and preserve such preference right as the stockholders may have to subscribe for unissued stock, the board of directors in a recommendation adopted at the December 1, 1925, meeting, recommended to stockholders that the above amendment be inserted into present by-laws.

BOSTON & MAINE.—1925 Earnings.—Preliminary statement of earnings for 1925 shows a net corporate income of \$4,972,165, as compared with \$1,772,737 in 1924. The income statement follows:

	Year 1925	Year 1924
Operating revenues	\$79,689,771	\$78,697,297
Operating expenses	61,895,332	63,912,556
Net operating revenue	17,794,439	14,784,741
Taxes	5,114,175	3,040,802
Equipment rents—Dr.	2,754,907	2,539,748
Joint Fac. rents—Dr.	184,827	220,222
Net railway operating income	11,721,891	8,972,022
Other income	855,932	466,492
Gross income	12,577,824	9,438,514
Deductions (rtls., int., etc.)	7,605,658	7,665,777
Net income	4,972,166	1,772,737

Stockholders Approve Reorganization Plan.—At a special meeting of the stockholders of the Boston & Maine, held on February 1 at Boston, the various proposals in connection with the reorganization of the company were approved. The necessary two-thirds majority of each class of stock were found to have voted in favor of the proposals. This gives the reorganization committee power to proceed and it also meets the requirements of the Massachusetts Department of Public Utilities and of the Interstate Commerce Commission.

CHICAGO & NORTH WESTERN.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue and sell \$23,663,000 of 5 per cent general mortgage bonds and to procure the authentication and delivery of \$4,225,000 of the bonds.

CHICAGO & WESTERN INDIANA.—Bonds Authorized.—The Interstate Commerce Commission has authorized the issuance of \$283,000 consolidated 4 per cent mortgage bonds, to be delivered to the carrier's tenants in repayment of sinking fund payments made in the nature of advances.

CHICAGO EASTERN ILLINOIS.—1925 Earnings.—Preliminary earnings statement for 1925 shows a deficit after fixed charges of \$53,285 as compared with deficit in 1924 of \$777,551.

CHICAGO GREAT WESTERN.—Notes.—This company has been authorized by the Interstate Commerce Commission to issue \$950,000 collateral gold notes in exchange for note of equal amount given to the Director-General of Railroads and since sold to Asiel & Co. of New York, and to pledge as collateral security therefor \$2,000,000 first-mortgage 50-year 4 per cent bonds.

CHICAGO, ROCK ISLAND & PACIFIC.—1925 Earnings.—A statement issued by Charles Hayden, chairman of the board, gives brief details of 1925 income, as follows:

"In connection with the publication of the December earnings, these statements indicate an earning of \$4.54 a share on the stock of the Rock Island, for the calendar and fiscal year 1925, compared with \$4.36 for 1924. "In connection with the present railway law in which a return of 5 3/4

per cent is allowed, it is interesting to know that these earnings are only equivalent to 4.13 per cent on the investment of the corporation as shown by its books.

"There was approximately \$550,000 more spent in maintenance of way than in 1924, and \$60,000 more on maintenance of equipment. The decrease in transportation expense was \$1,912,532. The transportation ratio for 1925 was 38.19 per cent.

FLORIDA EAST COAST.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue and sell \$15,000,000 of first and refunding mortgage 5 per cent bonds to J. P. Morgan & Co., at not less than 95.

GREAT NORTHERN.—Bonds Authorized.—The Interstate Commerce Commission has granted authority to issue \$5,000,000 of general mortgage, 5 per cent bonds, series C, to be sold at not less than 95 1/2. The purpose of the issue is to retire outstanding prior-lien bonds and general mortgage bonds bearing higher rates of interest or having earlier maturities.

MISSOURI-KANSAS-TEXAS.—1925 Earnings.—Preliminary earnings statement for 1925 shows net corporate income after charges and interest on adjustment bonds of \$6,117,619, equivalent after allowance for 7 per cent dividends on preferred stock to \$5.41 on each share of common stock. Net corporate income in 1924 was \$5,508,438, equivalent to \$4.72 a share on the common.

SEABOARD AIR LINE.—Control of Tavares & Gulf.—The Interstate Commerce Commission has authorized the Seaboard Air Line to purchase control of the Tavares & Gulf, and, in addition, has authorized the latter to issue \$425,000 first mortgage, 5 per cent bonds, series A, and the Seaboard Air Line to assume obligation and liability as guarantor for these bonds. The Tavares & Gulf extends from Ellsworth Junction, Lake County, Florida, to Ocoee in Orange County, 28 miles, with a branch from Waits Junction to Clermont, 5.93 miles. Connection with the Seaboard is made at Ellsworth Junction and the line serves an important agricultural section, capable of extensive development. The property is owned by the estate of Peter A. H. Jackson, to whom the carrier is indebted for unpaid bond principal and interest. Under the terms of the purchase the Seaboard will buy the stock of the former owners in payment for \$275,000 of the new bond issue. The vendors are to waive their claims and have also agreed to purchase additional bonds totaling \$150,000, the proceeds of which are to be used by the Tavares & Gulf for relaying approximately 31 miles of track with 70-lb. rails and new ties and for other improvements.

SOUTHERN RAILWAY.—1925 Earnings.—Preliminary earnings statement for 1925 shows net corporate income after fixed charges of \$22,579,172 as compared with \$17,769,140 in 1924. The balance after the 5 per cent preferred dividends was equivalent to \$32.52 a share of common stock in 1925 and to \$24.52 in 1924. The income statement follows:

	1925	1924
Gross operating revenues	\$149,313,892	\$142,486,514
Total operating expenses	103,811,952	102,674,674
Net revenue from operation	45,501,940	39,811,840
Taxes and uncollectible railway revenues	9,490,244	7,752,105
Equipment and joint facility rents	925,674	1,617,016
Railway operating income	35,086,021	30,442,720
Other income	5,273,998	4,842,661
Total gross income	40,360,020	35,285,381
Interest and rentals	17,780,847	17,516,241
Income over charges for year	22,579,172	17,769,140
Dividend on preferred stock	3,000,000	3,000,000
Balance after dividend on preferred stock	19,579,172	14,769,140

SOUTHERN RAILWAY.—Preferred Stockholders Claim Same Rights.—Arthur Lyman of Massachusetts on January 30 filed in the Law and Equity Court at Richmond, Va., a petition asking that the Southern Railway be restrained from paying more than a 5 per cent dividend on its common stock unless claims of preferred stockholders for any excess of earnings above that amount have been discharged. The petitioner maintains that the preferred stockholders have identical privileges with the common shareholders as to sharing in dividends in excess of 5 per cent. The petition is directed against the 1 3/4 per cent dividend on the preferred declared on December 10. It is claimed that the amount should not exceed 1 1/4 per cent until preferred shareholders have participated in the difference of 1/2 per cent.

On the same day entry of the decree of the State Supreme Court of Appeals was made denying a writ of error on the appeal from the lower court's decision, to stockholders who sought to force

the road to pay preferred dividends alleged to have been withheld for 30 years.

ST. LOUIS-SAN FRANCISCO.—Equipment Trusts Sold.—Speyer & Co., J. & W. Seligman & Co., and the Guaranty Company of New York have sold \$7,800,000 4½ per cent equipment trust certificates, series BB at prices to yield from 4.50 to 4.75 per cent, according to maturity.

ST. LOUIS-SAN FRANCISCO.—The Missouri Public Service Commission has authorized the sale of \$5,000,000 of two-year, 5 per cent bonds, the proceeds to be used as part payment in the purchase of 183,333 shares of common stock of the Chicago, Rock Island & Pacific. The purchase price of the stock was said to be \$10,250,000, the difference between the amount of proceeds from the note issue and the purchase price being paid in cash by the Frisco. The Rock Island stock will be put up as security for the notes issued.

Southern Pacific Expresses Views.—Henry W. De Forest, chairman of the executive committee of the Southern Pacific, is quoted as follows: "Purchase by the Frisco of an interest in the Rock Island is entirely satisfactory to the Southern Pacific. Those two systems connect at many points and can probably be operated together with greater efficiency and economy. If a railroad can save money by buying another road, it is wise to do so. Southern Pacific bought the El Paso & Southwestern as an investment and it has proved to be one."

WABASH.—Directors on Ann Arbor Board.—William H. Williams, chairman of the board of the Wabash; J. E. Taussig, president, and George W. Davison, Alvin W. Krech, J. Horace Harding and Winslow S. Pierce, directors of the Wabash, have been elected directors of the Ann Arbor, to represent the controlling interest in the latter, now owned by the Wabash.

Offer to Minority Stockholders.—The Wabash has offered minority holders of Ann Arbor stock to purchase their shares at \$70 for the preferred and \$45 for the common, the offer to remain open until April 1, 1926.

WESTERN PACIFIC.—Assists Feeder Line.—An offer has been made to holders of \$788,000 6 per cent bonds of the San Francisco-Sacramento (Electric) for an exchange of the bonds for an issue of 6½ per cent bonds. The authorized amount of bonds is to be reduced from \$3,000,000 to \$2,000,000. There will be issued \$988,000 of new bonds, \$788,000 to be exchanged for the 6 per cent bonds mentioned above and \$200,000 to be taken by the Western Pacific. The purpose of the exchange is explained as follows:

"Your company has been able to make a contract with the Western Pacific and the Sacramento Northern Railway (electric), owned by the Western Pacific, which provides construction by the Sacramento Northern, at a cost of about \$450,000, of a 13-mile branch line from Lisbon through the Holland district; this branch to be owned by the Sacramento Northern and leased to the San Francisco-Sacramento on the basis of 6 per cent of cost.

"It is the intention of the company, with assistance of the Western Pacific, to make other freight producing extensions, including extensions in the town of Pittsburgh to serve the Columbia Steel Company, the Redwood Manufacturing Company and several other industrial enterprises, and to construct industrial tracks at other points.

"The Western Pacific contract includes a trackage agreement over the San Francisco-Sacramento, which must be free from any danger of cancellation through foreclosure of the San Francisco-Sacramento bonds. This result can be brought about only by the surrender of the present bonds."

Dividends Declared

Buffalo, Rochester & Pittsburgh.—Common, 2 per cent; preferred, 3 per cent, semi-annually, both payable February 15 to holders of record February 5.
Cleveland & Pittsburgh.—Guaranteed, \$.87½, quarterly; special guaranteed, \$.50, quarterly, both payable March 1 to holders of record February 10.
Green Bay & Western.—5 per cent, payable February 8 to holders of record February 5.
Maine Central.—Preferred (account accumulated dividends) 7½ per cent; preferred, \$1.25, quarterly, both payable March 1 to holders of record February 15.
New Orleans, Texas & Mexico.—1¼ per cent, quarterly, payable March 1 to holders of record February 18.
Norfolk & Western.—Common, 1¼ per cent, quarterly, payable March 19 to holders of record February 27.
Pennsylvania.—\$.75, quarterly, payable February 27 to holders of record February 1.

Average Price of Stocks and Bonds

	Feb. 2	Last Week	Last Year
Average price of 20 representative railway stocks	95.38	94.72	81.94
Average price of 20 representative railway bonds	95.05	95.11	90.18

Railway Officers

Financial, Legal and Accounting

B. A. Bourgeois, for a number of years general paymaster of the Canadian National, has been appointed treasurer of the Atlantic region, succeeding the late P. E. Whelpley. Mr. Bourgeois will continue to make his headquarters at Moncton, N. B. **H. K. Goodwin**, assistant to treasurer, has been appointed assistant treasurer and paymaster.

Operating

G. Van Tassell has been appointed assistant to the general superintendent of the New York Terminal district of the New York Central and the Ottawa & New York.

M. Crown has been appointed superintendent of the South Florida division of the Seaboard Air Line, and also of the Charlotte Harbor & Northern, with headquarters at Arcadia, Fla.

C. L. Sauls has been appointed assistant superintendent and trainmaster of the Charlotte Harbor & Northern. **E. B. Harrison** and **R. M. Benton** have been appointed assistant trainmasters, and **R. M. Selvidge** has been appointed assistant chief dispatcher.

D. O. Quellet, superintendent of transportation of the Missouri Pacific, with headquarters at St. Louis, Mo., has been given the title of general superintendent of transportation, with the same headquarters, and the office of superintendent of transportation has been discontinued.

D. S. Farley, assistant general manager in charge of the Western district of the Atchison, Topeka & Santa Fe, Eastern lines, with headquarters at Topeka, Kans., has been given jurisdiction also over the Eastern district, succeeding **R. H. Allison**, promoted to acting general manager of the Eastern lines.

T. W. Parsons, formerly vice-president and general manager of the Charlotte Harbor & Northern, with headquarters at Arcadia, Fla., has been appointed general superintendent of the Southern district of the Seaboard Air Line, and of the Charlotte Harbor & Northern, with the same headquarters.

M. W. Bard, assistant superintendent of the Canadian Pacific, with headquarters at Farnham, Que., has been transferred to Smith's Falls, Ont., succeeding Mr. Quilty, promoted. **J. O. Fortier** has been transferred to the Farnham division, with headquarters at Sherbrooke, Que., succeeding **F. A. Winter-son**, who succeeds Mr. Bard at Farnham, Que.

R. C. Watkins has been appointed chief dispatcher of the Virginia division of the Seaboard Air Line, with headquarters at Raleigh, N. C., succeeding **D. F. Shepherd**, assigned by request to other service. **W. W. Stanton** has been appointed passenger trainmaster of the Central Florida division, with headquarters at Tampa, Fla., succeeding **J. C. Stribling**, transferred.

F. C. Fox, general manager of the Eastern lines of the Atchinson, Topeka & Santa Fe, with headquarters at Topeka, Kan., has been granted leave of absence on account of ill health. **R. H. Allison**, assistant general manager in charge of the Eastern district, has been promoted to acting general manager of the Eastern lines, with the same headquarters, in place of Mr. Fox.

David T. Hanna has been appointed superintendent of the Harlem and Putnam divisions of the New York Central and the Ottawa & New York, with headquarters at White Plains, N. Y. Mr. Hanna heretofore has been superintendent of the Adirondack and Ottawa divisions of the New York Central, with headquarters at Utica, N. Y., to which position he was appointed in November, 1924, and a sketch of his railway career appeared in the *Railway Age* of November 22, 1924.

A. J. May, who has been appointed superintendent of terminals of the Southern, with headquarters at Chattanooga, Tenn., was born on March 24, 1881, at Fayetteville, Ala., and was educated in the public school and the Fourth District College, Sylacauga, Ala. He entered railway service in March, 1900, as a brakeman on the Louisville & Nashville, which position he held until September, 1904, when he entered the service of the Alabama Great Southern in the same capacity. From November, 1904, to September, 1922, he was conductor on the same road, and, on the latter date, became yardmaster at Attala, Ala., which position he was holding at the time of his recent appointment to superintendent of terminals of the Southern.

The following changes in the operating districts of the Seaboard Air Line, under the supervision of the general superintendents named, have been made, effective January 31. The Northern district will include the Virginia, North Carolina and South Carolina divisions, under the supervision of **G. V. Peyton**, general superintendent, with headquarters at Savannah, Ga. The Western district will include the Georgia, Alabama and East Carolina divisions, under the supervision of **G. R. Carlton**, general superintendent, with headquarters at Savannah, Ga. The Central district will include the North Florida and West Florida divisions, under the supervision of **E. C. Bagwell**, general superintendent, with headquarters at Jacksonville, Fla., and the Southern district will include the South Florida and the East Florida divisions, under the supervision of **T. W. Parsons**, general superintendent, with headquarters at Arcadia, Fla.

J. E. Davenport has been appointed superintendent of the Adirondack and Ottawa divisions of the New York Central and the Ottawa & New York, with headquarters at Utica, N. Y. Mr. Davenport was born on October 8, 1887, at Charles Town, W. Va. He attended the Atlanta, Ga., public schools and was graduated from the Georgia School of Technology in 1909 with the degrees of Bachelor of Science and Mechanical Engineer. He entered railway service on August 1, 1909, as a special apprentice in the motive power department of the New York Central & Hudson River, where he remained until April 1, 1912, when he became enginehouse foreman in the same department. From July 1, 1914, to March 1, 1917, he was engineer, dynamometer car, New York Central Lines, and on the latter date became a special engineer in the office of the assistant to the president. He became trainmaster of the Harlem division of the New York Central on June 1, 1917, and was transferred to the Mohawk division on November 1, 1918, where he remained until May 1, 1920, when he became engineer of dynamometer tests. He was appointed superintendent of fuel and locomotive performance on February 1, 1923, which position he was holding at the time of his recent appointment.

Mechanical

F. S. Markett has been appointed master mechanic of the Charlotte Harbor & Northern.

J. J. Hanlin, superintendent of motive power of the Seaboard Air Line, has had his jurisdiction extended to include the Southern district, and has also been appointed superintendent of motive power of the Charlotte Harbor & Northern, with headquarters at Jacksonville, Fla.

The appointment of **P. W. Kiefer** as chief engineer of motive power and rolling stock of the New York Central was announced in the *Railway Age* of January 23. His jurisdiction includes all the New York Central Lines and not merely the New York Central Railroad, as might have been inferred from the announcement.

Thomas E. Cannon, general master mechanic of the Great Northern, with headquarters at Superior, Wis., has been appointed general superintendent of locomotives and equipment of the Pittsburgh & West Virginia, with headquarters at Pittsburgh, Pa. He was born on April 23, 1856, at New York, N. Y., and was educated in the public schools at New York. He entered railway service in 1871, with the St. Paul & Pacific, afterwards the St. Paul, Minneapolis & Manitoba, and now the Great Northern, and until October 3, 1875, was a machinist's apprentice. From October 3, 1875, to April 6, 1878, he was a

fireman, and from the latter date until December, 1895, was a locomotive engineer. At that time he became master mechanic, and later became general master mechanic, of the Lake district, which position he was holding at the time of his recent appointment as general superintendent of locomotives and equipment of the Pittsburgh & West Virginia.

Engineering, Maintenance of Way and Signaling

C. M. Cannon has been appointed division engineer of the Charlotte Harbor & Northern.

E. N. Philips has been appointed assistant valuation engineer of the Bessemer & Lake Erie, with headquarters at Pittsburgh, Pa.

R. C. Smith has been appointed chief engineer, in charge of engineering and maintenance, of the Minneapolis, Northfield & Southern.

Frank C. Shepherd, who has been appointed chief construction engineer of the Boston & Maine, was born on December 21, 1870, at Gloucester, Mass., and was educated at the Gloucester High School and at the Massachusetts Institute of Technology. He entered railway service in 1902 as a resident engineer, on the New York Central, with headquarters at New York, and left the service of the New York Central in 1906. In 1912 he became engineer of construction on the Boston & Maine, and from 1914 to 1917, was valuation engineer. He was the principal assistant engineer from 1917 to 1920, and then became assistant chief engineer, which position he was holding at the time of his recent appointment to chief construction engineer.

W. D. Simpson has been appointed assistant engineer maintenance of way, of the Seaboard Air Line, with headquarters at Savannah, Ga. **E. L. Cannon** has been appointed division engineer of the Alabama division, with headquarters at Savannah, Ga., succeeding **R. W. Bonney**, transferred. **G. W. Shoemaker** has been appointed division engineer of the West Florida division, with headquarters at Tampa, Fla., succeeding **H. O. Kaigler**, who has been transferred to the East Florida division, with headquarters at Sebring, Fla., succeeding **A. O. Wilson**, promoted to district engineer maintenance of way of the Western district, with headquarters at Savannah, Ga. **R. L. Tatum** has been appointed division engineer of the North Carolina division, with headquarters at Hamlet, N. C., succeeding **O. F. McNairy**, who has been promoted to district engineer maintenance of way of the Central district, with headquarters at Jacksonville, Fla. **E. D. Hall** has been appointed division engineer of the South Carolina division, with headquarters at Jacksonville, Fla., succeeding **Mr. Tatum**, transferred, and **C. A. McRae** has been appointed division engineer of the Virginia division, with headquarters at Raleigh, N. C., succeeding **J. W. Sexton**, who has been promoted to district engineer maintenance of way of the Southern district, and of the Charlotte Harbor & Northern, with headquarters at Arcadia, Fla.

Purchases and Stores

Frank Riley, chief clerk to the general storekeeper of the Chicago & Alton, with headquarters at Bloomington, Ill., has been promoted to general storekeeper, with the same headquarters, succeeding **G. A. Secor**, whose resignation to enter other business was reported in the *Railway Age* of January 30. **H. O. Wolfe**, traveling storekeeper, with headquarters at Bloomington, has been promoted to assistant general storekeeper, with the same headquarters, a newly created position. **E. L. Murphy**, division storekeeper, with headquarters at Slater, Mo., has been promoted to traveling storekeeper, with headquarters at Bloomington, in place of **Mr. Wolfe**. **G. H. Wall** has been appointed division storekeeper at Slater, succeeding **Mr. Murphy**.

Special

W. L. Flanery has been appointed supervisor of agriculture of the Missouri & North Arkansas, with headquarters at Harrison, Ark.

The name of the safety department of the Southern has been changed to the department of the safety and sanitation. **D. H. Beatty** is the superintendent.